96-34

NUCLEAR SITING AND LICENSING PROCESS (LIMERICK ATOMIC POWER STATION, PA.)

OVERSIGHT HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT

OF THE

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS HOUSE OF REPRESENTATIVES

NINETY-SIXTH CONGRESS

SECOND SESSION

ON

NUCLEAR SITING AND LICENSING PROCESS
(LIMERICK ATOMIC POWER STATION, PA.)

HEARING HELD IN NEWTOWN, PENNSYLVANIA
MAY 27, 1980

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NUCLEAR SITING AND LICENSING PROCESS (LIMERICK ATOMIC POWER STATION, PA.)

TUESDAY, MAY 27, 1980

U.S. House of Representatives,
Subcommittee on Energy and the Environment,
Committee on Interior and Insular Affairs,
Newtown, Pa.

The subcommittee met, pursuant to notice, at 10 a.m., at Bucks County Community College, Newtown, Pa., Hon. Peter Kostmayer presiding.

Mr. Kostmayer. The Subcommittee on Energy and the Environment will come to order. I have a brief opening statement which I would like to make. Also, Representative Morris K. Udall, the chairman of both this subcommittee and the Committee on Interior and Insular Affairs, has a brief prepared statement that will be printed in the record immediately following my opening remarks. We will then turn to other members of the committee for opening statements and then we will proceed with our first witness.

In the almost 14 months since the accident at Three Mile Island, major changes have occurred in America's attitude toward nuclear energy. Only a few weeks ago such changes were vividly portrayed on the Nation's television screens as scores of central Pennsylvania citizens directed their outrage at officials of the Nuclear Regulatory Commission over the proposed venting of krypton 85 gas now trapped in the crippled containment vessel at Three Mile Island. The question of nuclear energy has become a central issue in the politics of our country and the dialog between its friends and foes becomes more apparent each day. And now we who live here in southeastern Pennsylvania are drawn into the debate.

On the banks of the Schuylkill River is now rising the Limerick Nuclear Power Station. Within its range almost 4 million Americans make their homes—farmers, city dwellers and suburbanites. Of the nuclear plants now operating in this country, only two, Zion near Chicago and Indian Point outside New York City are near more people. For the Congress and for this committee, there is no more important question than the public health and safety and for those of us who are so near to Limerick, the question is especially compelling. Who is prepared to protect the public health and safety? The Nuclear Regulatory Commission? The Congress? The Philadelphia Electric Co.? The State of Pennsylvania or those counties, boroughs and townships surrounding the plant?

In the hours after the accident at Three Mile Island, only confusion reigned in the central Pennsylvania countryside. Neither the Federal, State or local officials seemed to be in charge and in the words of the Chairman of the Nuclear Regulatory Commission, "We were staggering around like blindmen in the dark." Who is in charge then and what were their responsibilities for safety and health of the 1 million Americans who live within 25 miles of the Three Mile plant? Today confusion still reigns, but there is fear and anger also and in the judgment of many public and private citizens alike, there seems little else, for today we are hardly better prepared to deal with a nuclear emergency than we were 14 months ago.

Pennsylvania still does not have a federally approved emergency evacuation plan, nor is there a Federal law which requires it to. Pennsylvania is not alone. More than half the States which have nuclear plants have no approved plans to evacuate their citizens in the event of an accident.

On March 30, 1979, the General Accounting Office issued a report which concluded there is only limited assurance that persons living or working near nuclear facilities would be adequately protected in case of a serious although unlikely nuclear accident. The report recommended that new operating licenses be contingent upon the Federal approval of State and local plans. Then the Committee on Government Operations on which I served issued a report in November 1979 agreeing with the GAO's recommendation. They found that emergency preparedness at every level of responsibility, Federal, State, and local government and utility companies, is inadequate to protect the public health and safety in the event of a severe nuclear powerplant accident. As these reports concluded and as the report of the President's Commission on Three Mile Island confirms, the NRC as well as nuclear industry had operated under the assumption that the possibility of an emergency or accident was so small and the built-in safety features of nuclear power so fail-safe that emergency planning was largely irrelevant.

Indeed in commenting on the March 1979 GAO report, the NRC said that State and local emergency plans are not essential in determining whether or not the plant can be operated without undue interest to the public health and safety. The NRC is today reexamining this issue of emergency planning. It is now considering a new rule based upon those recommendations and is expected to reach a final decision sometime next month, but this proposed rule also raises serious questions. It allows a utility to continue to operate a nuclear powerplant, even if there is no federally approved State and local emergency plan.

The NRC has also asked PE to reevaluate the consequences of the most serious kinds of accidents at the Limerick site, including the consequences of a core meltdown. The study is long overdue. At the same time, the NRC's decision not to suspend or even to modify the terms of Philadelphia Electric's construction permit raises additional questions. For the further we proceed with the construction of these enormous facilities and the greater the financial stake for both the utility and the people, the more difficult it becomes to assess the real cost and benefits of the project or possible alternatives to it.

And so in the midst of changing attitudes in Washington and throughout America, this subcommittee holds the first congressional hearing to consider these issues of emergency preparedness in relation to the Limerick plant. We meet here today to consider what should have been considered long ago—that is the public health and safety of the people of southeastern Pennsylvania. We hope to shed more light on the subject and insure that this region and its people can once again feel confidence in their Government and in its ability to protect them, their families and their communities. That concludes my opening remarks. Before recognizing my colleagues on the panel for their introductory comments, let me insert in the record the prepared statement of our distinguished chairman, Mr. Udall.

[The prepared statement of Hon. Morris K. Udall, follows:]

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U. S. HOUSE OF REPRESENTATIVES
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT

OVERSIGHT HEARING
NUCLEAR SITING AND LICENSING PROCESS
(LIMERICK ATOMIC POWER STATION, PA.)

Tuesday, May 27, 1980

STATEMENT OF THE HON. MORRIS K. UDALL, CHAIRMAN

The purpose of this hearing is to gather information about the functioning of the nuclear licensing process in the case of the Limerick Atomic Power Station now under construction in Pennsylvania. This hearing -- one of a series of hearings and field studies held by the Subcommittee throughout the nation -- has been scheduled by the Interior and Insular Affairs Committee as part of its congressional oversight responsibility for the regulation of commercial nuclear power in this country.

The Subcommittee, in conducting the hearing, is not conducting an inquiry into the question of whether or not construction of the Limerick plant should continue or whether the plant should be allowed to operate. Such decisions properly reside with the Nuclear Regulatory Commission as do all regulatory decisions. The Committee's concern is whether our nuclear regulatory process is functioning as Congress intended.

This oversight hearing will serve as a "case study" of the nuclear licensing process, and will assist the Subcommittee to weigh decisions pertaining to proposed legislative changes in the nation's nuclear policies. The Subcommitte similar "case study" hearings in the past -- notably on the Seabrook, Diablo Canyon and Skagit nuclear generating stations -- and found these inquiries to provide a helpful perspective on the nuclear regulatory process.

One area of interest to the Subcommittee is the process by which the adequacy of state, local and utility radiological emergency response plans are evaluated prior to the issuance of an operating license. Limerick provides a useful case study in this regard because the plant is located in a region of relatively high population density, where emergency preparedness presents unique and difficult problems.

Also, the Subcommittee is aware that some believe the Limerick plants should be converted to coal-fired stations. While the Subcommittee will make no judgements on the merits of this specific proposal for Limerick, we would like to learn how, if at all, the licensing process addresses and resolves an issue of this kind.

Mr. **Kostmayer.** I would like to give each Member of Congress who is here as a member of this committee an opportunity to make an opening statement.

I recognize the gentleman from Kansas, Mr. Glickman.

Mr. **Glickman.** Thank you, Peter.

It is a pleasure for me to be here. I am not a member of the Interior Committee, but I am a member of the Science and Technology Committee of the House, which has jurisdiction over all issues relating to research and development on all energy technologies, and specifically for nuclear energy. I am also the author of an amendment which would for the first time bring full-time inspectors at all operating nuclear plants and plants under the final stages of construction, that is, NRC inspectors, and that amendment is now law.

I believe that nuclear power can play an important part in this Nation's energy future, but only if the public perceives it to be safe and only if all the safeguards are undertaken to insure that in the event an unexpected accident occurs, evacuation plans are in place.

It is a pleasure for me to be here in this beautiful countryside of Pennsylvania and to listen and learn about issues regarding this particular nuclear plant.

Thank you.

Mr. **Kostmayer.** Thank you, Congressman Glickman.

I recognize the gentleman from Nebraska, Mr. Cavanaugh.

Mr. **Cavanaugh.** I thank my colleague and friend for the opportunity to be here and I also look forward to an important and significant hearing as the testimony and the proposed witnesses for today, I think, are going to break new ground in this fundamentally important issue, not only for the people of southeastern Pennsylvania, but for the entire country. There is no question if we are to meet the energy needs of this Nation and if nuclear energy continues to play a significant role, it can only occur in an atmosphere in which there is confidence in the American people in their secure safety while enjoying the benefits of nuclear energy.

I expect this hearing to have significant implications not only for the people of Pennsylvania, but for people of this Nation, and I appreciate the opportunity to participate in this hearing.

Mr. **Kostmayer.** Thank you, Mr. Cavanaugh.

I recognize the gentleman from Massachusetts, Mr. Markey.

Mr. **Markey.** Thank you, Congressman.

I am very much interested in this hearing because I think that people in America have begun to question the veracity of assurances that they have received from the industries of America over the years that a Love Canal cannot occur; or that a Three Mile Island cannot occur. So the kinds of instances that have transpired over the last several years have given us every reason to begin to question some of those long-term assurances that have been given to us by the industry.

I think that one of the important contradictions and interesting ironies in all this is that here as we sit in Pennsylvania, on the motherlode of coal in the world, that we could have used coal-fired generating plants and yet we are still discussing a nuclear powerplant. But I think within a minimum we owe people, if we are to continue construction of nuclear powerplants in that neighborhood, the protection we can afford by assuring evacuation plans are in place if, God forbid, an accident did occur. We have to give them that measure of protection that they need and they deserve. A decision of the past that perhaps is ill founded put us in this position and can at least be put into the kind of posture to minimize this kind of danger.

That is why I think this hearing is going to be healthy and hopefully will serve a worthwhile purpose of affording safety to the people of Pennsylvania.

Mr. KOSTMAYER. Thank you, very much.

We are going to proceed with our first witness. Our first witness is Mr. Harold Denton. Mr. Denton is the Director of the Office of Nuclear Reactor Regulation with the U.S. Nuclear Regulatory Commission.

Mr. Denton, we are delighted to have you with us this morning. Everyone here across America recognizes your face from your role at Three Mile Island. You may feel free to read your statement, summarize, or proceed in any way you wish. Please begin.

[The prepared statement of Hon. Harold Denton may be found in the appendix.]

STATEMENT OF HON. HAROLD DENTON, DIRECTOR, OFFICE OF NUCLEAR REACTOR REGULATION, U.S. NUCLEAR REGULATORY COMMISSION

Mr. DENTON. I am pleased to appear today to discuss the status of the Limerick project with respect to (1) emergency planning and preparedness and (2) the response of the applicant and the lessons learned from the accident at Three Mile Island.

Philadelphia Electric Co. has not submitted the final safety analysis report, therefore, we cannot evaluate any emergency planning preparedness aspect of the place in sight. I will, however, describe emergency planning criteria which will be used for this plant and the manner in which our staff will conduct the review. I will also describe two special studies which are underway.

Significant changes have taken place in the NRC's approach to emergency planning. In the past, the NRC staff relied primarily upon plant design features for protection of the public. Our current approach places significantly increased emphasis on emergency planning as a necessary additional measure required for the protection of public health and safety. These changes have stemmed in part from our experience with TMI, and also from an extensive study which began back in 1976 by a joint NRC/EPA task force. Probably the most influential development is an explicit consideration of the total spectrum of potential radiological accidents. Formerly the planning process had been based only on a limited portion of the spectrum—to accidents of severity up to and including the most serious design basis accident. Now, the planning process has been expanded to include core melt accidents.

The traditional interpretations usually associated with such concepts as "the facility environs" or "rapid notification" take on a new meaning when considered in light of planning for the entire accident spectrum. Including the severe accidents increases the planning distances involved and shortens the time available for decisionmaking and early warning of the public.

Detailed planning has been expanded to include the emergency planning zone as recommended by the joint NRC/EPA task force. The emergency planning zone concept provides for two generic planning zones around the nuclear powerplant—an inner zone of about 10 miles in radius for the plume exposure pathway and an outer zone of about 50 miles in radius for the ingestion exposure pathway. Hence our current criteria contain objective requirements on the time for providing early warning and clear instructions to the public in the event of a serious accident, as well as provisions for taking protective measures based on predetermined action levels readily available to the facility operator in the reactor control room.

Our perception of the role of State and local plans developed in support of the licensee's emergency plans has also changed. Whereas previously we considered offsite planning as a matter of prudence, we now consider it a matter of necessity. We, in cooperation with the Federal Emergency Management Agency, have developed specific acceptance criteria not only for licensees' plans, but also for State and local plans which we consider essential in assuring an acceptable state of preparedness.

The specific requirements and details which defined our current approach on emergency preparedness are set forth in our proposed NRC rule and in NUREG-0654. The final rule is expected to be published in June of this year. The report provides interim guidance and acceptance criteria for licensees as well as State and local governments in the preparation of their radiological emergency plans. The document was the product of a joint effort between NRC and FEMA and it will be used by the two agencies in determining the adequacy of State, local, and licensee emergency plans. Prior to issuance of an operating license for Limerick, NRC will require an acceptable finding on the overall state of emergency preparedness which includes the supporting State and local governments. Our finding will be based not only on an assessment of the plans developed by the Philadelphia Electric Co., but will also include a review of the FEMA findings as to whether the State and local plans are adequate and capable of being implemented.

President Carter, on December 7, 1979, directed FEMA to take the lead responsibility for all offsite nuclear emergency planning and response. The effect of that decision is that FEMA, rather than NRC, will now assess State and local emergency response plans and make findings as to the adequacy of those plans as well as the State and local capability to implement such plans. NRC and FEMA issued a memorandum of understanding on January 14 of this year which delineates the authority and responsibility of each agency, and the cooperative measures required to achieve our common goal. FEMA's findings will be provided to the NRC and will be used by our staff in the licensing process for making a determination on the overall state of emergency planning for new applications for a license as well as for current operating plants. Chairman Ahearne has sent a letter to Senator Simpson which proposes new legislation in this area. The proposed changes would give total responsibility to FEMA for offsite preparedness including public participation in the determination of plan adequacy. The FEMA determination would then be final and not subject to the adjudicatory process in NRC proceedings similar to the EPA role in water matters.

Although the proposed rule on emergency preparedness has not yet been made final, it would establish requirements for rapid identification and uniform classification of accidents, together with prompt notification to offsite authorities. Emergencies are to be classified into one of four categories and based on objective criteria known as emergency action levels. These emergency action levels are observable process parameters in the control room.

Our intent is to simplify the decisionmaking process during the initial stages of an emergency, and to minimize the subjectiveness during a potentially stressful situation. Because State and local plans would recognize the same emergency classification scheme, we expect that a better understanding on the part of the responsible offsite agencies regarding the nature of the emergency and its potential consequences will result in more effective communications. We are requiring the facility operator to install redundant communications systems which provide for direct contact with the State and local officials having the responsibility for implementing protective measures in the environs. We will also require the applicant to establish a nearsite emergency operations facility for the continued evaluation and coordination of all licensee activities related to an emergency having or potentially having environmental consequences. This facility will provide information needed by Federal, State, and local officials for implementation of their emergency plans in addition to making available a centralized meeting location for key representatives.

Another significant requirement deals with providing early warning and clear instructions to the public in the event of a serious radiological emergency. We are requiring that the capability be in place which permits initial notification by offsite officials to the public within approximately 10 miles from the facility, within about 15 minutes following notification from the licensee that a serious condition exists. Associated with the system is a requirement for a public information program which includes no explanation as to how the public would be notified, what actions the public would be expected to take in the event of an emergency.

Our emergency planning requirements have also been expanded to assure continued effective assessment of actual or potential consequences both onsite and offsite. We are requiring additional offsite dosimetry in all sectors surrounding the plant and in other areas of special interest. Within the plant, we are requiring significantly extended monitoring capability in order to insure that the radiological monitoring instrumentation will remain on scale even in the event of core melt accident. We have also established requirements for an onsite technical support center which is intended to provide in-depth technical support to the control room activities. This center will be habitable during emergencies to the same extent as the reactor control room, and it will alleviate the congestion and the confusion in the control room which was in evidence during the TMI accident.

In order to assure effective implementation of emergency measures, we are requiring the applicant to have detailed written agreements to all parties having a response role. These agreements will delineate the emergency measures to be provided and the mutually acceptable criteria for their implementation. In addition, the State and local plans will contain provisions for explicit protective measures within the 10-mile planning zone, including detailed evacuation plans out to that distance. In the case of Limerick, the affected counties include Berks, Chester, and Montgomery.

We have also increased our emphasis on the requirements for continued maintenance of an adequate state of emergency planning throughout the life of the plant. We are requiring additional specialized training and periodic retraining of the various categories of emergency personnel—ranging from the onsite emergency coordinator to the offsite local services. We are also requiring periodic emergency preparedness exercises. These exercises will involve Federal, State and local government participation, but will not involve mandatory public participation.

We have requested the applicant to submit evacuation time estimates so that special planning problems around the facility can be identified. This should be completed and made available within the next few weeks.

In addition, we have requested FEMA to perform independent studies on this matter. We understand that the FEMA time estimates for evacuation will be completed in June 1980. A significant concern related to protective measures centers around the various institutions located within the 10-mile emergency planning zone. There are a total of 16 facilities for which additional planning considerations would be required. Four of the institutions in particular—the Pennhurst Center, the Pottstown Memorial Medical Center, the Graterford Prison, and the Montgomery County Geriatric and Rehabilitation Center—will require further study because of their proximity to the plant and/or the extensive resources and time needed for evacuation. For these situations, analyses which consider future alternative protection strategies, including sheltering and the use of radioprotective drugs, will be needed.

The licensee's final Safety Analysis Report must also address the upgrading actions taken as a result of the experience from the accident at Three Mile Island and the recommendations of official studies and investigations of the accident.

These investigations include those that have been conducted by the Congress, the General Accounting Office, the President's Commission on the Accident at Three Mile Island, the NRC Special Inquiry Group, the NRC Advisory Committee on Reactor Safeguards, the Lessons-Learned Task Force and the Bulletins and Orders Task Force, the special review group of the NRC Office of Inspection and Enforcement, the NRC Staff Siting Task Force and Emergency Preparedness Task Force and the Offices of Standards and Research.

The results of the NRC's review of these investigations and reports are addressed in the document entitled, "NRC Action Plans." This action plan is currently undergoing review and approval by the Commission.

A brief description of the tentatively approved or proposed licensee requirements is presented in appendix A of this testimony.

Implementation of the action plan will improve the operation of the plan so that the number of events which could lead to accidents is reduced. It will also improve the ability of the operating staff to recognize such events and take appropriate corrective actions. The prevention of accidents is addressed through improvements in the selection and training of not only the operators, but all the plant staff and improvements required in the content and level of training courses, in the use of plant simulators, in operating procedures and in the design of the controls and instrument displays in the control room. These specific improvements both reduce the incidence of accident situations and increase the ability of the operating staff to arrest an accident before any serious consequences result. Improvements in the evaluation of operating experience and the auditing of day-to-day plant operations are also to be instituted.

Means of improving current plant designs were also identified. The accident at Three Mile Island reemphasized the importance of high system reliability, even though there were no significant equipment failures other than the relief valve on the pressurizer. Therefore, the action plan contains requirements for the assessment of some of the engineered safety features and an overall assessment of accident probabilities and consequences using simplified reliability analyses. These analyses are directed toward identifying and correcting specific weaknesses in current designs.

In addition to these requirements, the staff on May 6 requested the licensee to conduct a risk evaluation of the Limerick generating station. This evaluation would utilize the methodology used in the reactor safety study, sometimes called WASH-1400, but would include specific information relating to the Limerick site in order to arrive at a relative risk comparison for the Limerick generating station as compared to the WASH-1400 reference plant.

This concludes my prepared remarks, Mr. Chairman, and thank you for this opportunity to appear before your subcommittee.

Mr. KOSTMAYER. Mr. Denton, thank you very much for your testimony. I have a couple of questions which I would like to ask.

In an article on May 12 of this year in the Bucks County Courier Times, Carl Abraham, Nuclear Regulatory Commission, is quoted as saying, "If somebody came in and requested to build a nuclear powerplant there"—meaning Limerick—"we would probably reject it because of the population density." He was speaking of the population today.

Can you give me any indication of what has changed since the Limerick plant received its construction permit back in 1974 and how you are reevaluating the situation in terms of population density today?

Mr. DENTON. Up until about the mid-1970's, the NRC had no population criteria. The plants were evaluated on whether or not the safety features at that plant were considered compensation for the population density. You may recall this issue first came to a head with the Hope Creek facility near Philadelphia and the licensee proposed to build a plant very near a population center and we requested that licensee to move the plant from there to Salem.

Shortly after that, we began doing a detailed look at all tentative sites to be sure that if an applicant proposed a facility in a highly populated area, that there was not a better site or site of equal environmental significance in a lower population density available.

Since that Limerick facility was docketed and construction began, we have on occasion rejected sites because we thought they were in areas where the population was too high.

Mr. Kostmayer. To what extent was population a factor back in 1974; a factor at all?

Mr. Denton. It was essentially the initial design of the plant, but since Limerick fell within, at that time, the accepted population envelope, no special look for other population sites in this area was undertaken.

Mr. Kostmayer. But the attitude of the NRC toward the factor of local population density has now changed, I gather, very dramatically since the time the plant got its construction license in 1974?

Mr. Denton. Yes, sir. Today if any plant comes in with a population density of in excess of 500 people per square mile, we conduct a very extensive search for alternatives.

Mr. Kostmayer. Five hundred people per square mile. The Limerick plant would be about three times that; is that correct?

Mr. Denton. I think it is about double that in 1980.

Mr. Kostmayer. Double that in 1980. Are you reevaluating, therefore, the construction permit at this point and is there a possibility that the construction permit which was granted might be modified?

Mr. Denton. That was the reason for the letter I sent in May, which there is a provision in our regulations that allows me to modify or revoke or suspend a license. What I have done is asked the licensee to provide that information I need to make a decision as to whether the license is to be modified or revoked. The way I intend to approach the problem is to have them undertake a detailed risk assessment report using specific population density around Limerick, the specific meteorology of the plant, the evacuation times and the specific plant design so I will get a much better objective understanding of whether the design features in the plant adequately compensate for the population density or whether there is an undue risk in the operation of this plant. I have given the applicant 120 days to prepare that study. Once I get the results of that, I will be in a much better position as to whether changes should be made or the license be revoked.

Mr. Kostmayer. I am interested to know what the risk assessment study, which is, I gather, currently conducted by the utility, will show us. Will it demonstrate the probability of an accident or will it demonstrate what would happen if an accident occurred? I think there is a distinction there. Will it answer both or what exactly will it tell us?

Mr. Denton. What it is intended to do, is to answer both, and I use the word risk as a product of probability and consequences. In the Reactor Safety Study, the base line case for boiling water reactors was the Peach Bottom reactor, which incidentally is also owned by Philadelphia Electric Co., and that is located on a site of what I would call an average site in the United States. So the applicant is to study both the probability of accident in the specific Limerick design which has different features than Peach Bottom and also reflect the consequences to be more severe at the Limerick site than Peach Bottom. So it is intended to be an overall risk assessment looking for probability and consequences for a core meltdown accident.

Mr. KOSTMAYER. When you spoke about the compensating factors, what you meant, and correct me if I am wrong, is that the nearer the plant is to populated areas, such as with the Indian Point plant, the Zion plant, and the Limerick plant, you would require the plant to install additional design features; is that right?

Mr. DENTON. Yes, that is correct. I think before Three Mile Island if a plant met certain standards established by the Commission, we did not modify the plant's design to reflect a different population density around them. Our attitude today would be to require this plant to compensate either through design or through increased emergency planning to see whether or not it can represent no more than an average contribution to risk. The kinds of changes we have in mind would be filter containment and other engineering fixes which will reduce the consequences if any accident did occur.

Mr. KOSTMAYER. What you are saying to Philadelphia Electric is if you are going to locate this plant within 30 miles of almost 4 million people, it has got to be as safe as possible and we may require you to do some things which other plants located in more isolated areas might not be required to do?

Mr. DENTON. That is correct.

Mr. KOSTMAYER. Does that not lead us down a dangerous road where we come to rely more and more on the technology and forget the limits and failures of technology, as in Three Mile Island. I worry about that because, being a bit facetious, could we not then locate a plant if it were the safest plant in the world in, for example, a large city or in downtown Philadelphia? Where does that course lead us?

Mr. DENTON. I do not think there is any cause to locate a plant in a very populated area. You may recall that a plant was proposed called Ravenswood in downtown New York City sometime back. If you located a plant in there, you could locate it anywhere. That was rejected by the NRC. I think we need to be careful in relying on engineering safety features because there is always the possibility they will not perform as expected. The kinds of things we are talking about doing are passive systems which would be in place which would not require operator action and special facilities containing core catchers that I call a passive system that no pumps have to run, no systems have to operate and are very effective in mitigating the consequences of an accident.

Mr. KOSTMAYER. Let me shift to another area briefly if I can. That is the amount of electricity which the Limerick plant will be providing. It is my understanding that when the plant requested a construction permit, that the rate at which the use of electricity was growing in this area was about 7 percent a year. But that is considerably down, 2 percent now a year or less. Philadelphia Electric has provided us with documents which reveal what their reserve capacity will be once the Limerick plant comes on line. The Pennsylvania-Jersey-Maryland requirement for reserve capacity is about 20 percent. And, correct me if I am wrong, the Federal Government's guidelines provide for somewhere between 15 and 20 percent reserve capacity. But in 1987, with

Limerick on line, there would be reserve capacity of 42 percent. I wonder if you first can correct me if I am wrong about my initial figures in terms of what is needed generally and, second, if the NRC had the opportunity to look at how much reserve capacity will be provided here and is it more than we need and especially more than we would have needed when we first approved construction back in 1974?

Mr. **Denton**. The NRC has a two-stage review process in which we take a hard look at those factors when we issue construction permits. Except for very unusual circumstances, we do not reopen a case on the issue of need. We have reopened it occasionally, otherwise reassess the issues which depend a lot on the economy of the country. I do know the electrical consumption in the entire country is down quite a bit this year from last year, for example, but the plant will not be finished until 1985 and there are different provisions over how much will be needed in 1985. We do not reopen this issue, but it is not uncommon for licensees to modify the construction schedule of the plant so the plant is not finished until it is actually needed. So there is a self-regulated future, in a sense, in the amount of money the utility spends on a plant to finish it.

Mr. **Kostmayer**. So in addition to taking into consideration new population projections, you will also be taking into consideration new consumption projections of electricity?

Mr. **Denton**. Yes.

Mr. **Kostmayer**. Let me ask you another question or two before I yield to my colleagues.

Did you say in your testimony that in your opinion the utilities should be able to provide within 15-minute-time information to all of the local authorities in the surrounding adjacent area? Would that be the 10-mile radius that you were referring to?

Mr. **Denton**. That is within the 10-mile radius. We think total emergency plan from the time the utility alerts the State and local officials, they should be able to provide the warning to everyone within 10 miles within about 15 minutes. We do not expect people to leave within that time, but just to get the warning to them.

Mr. **Kostmayer**. I do not know whether you can answer the next question or not. Given what has changed, can you give us any indication what your attitude would be if Philadelphia Electric Co. were to apply today for a construction permit for a plant in this area?

Mr. **Denton**. I think we would take a very hard look at alternatives today, alternative sites. I have not gone back to see what sites were considered and rejected. Basically, we take a look within the service area and we look not just at population, but also environmental impacts. We have to take into account not just the safety side, but the environmental side.

Mr. **Kostmayer**. This is an area where there is a rapidly changing point of view, at least on the part of the NRC and the Congress and those parties involved.

Thank you, Mr. Denton. I now recognize Mr. Glickman, the gentleman from Kansas.

Mr. **Glickman**. First of all, Mr. Denton, I do not think I have met you before. I must compliment you on what I consider during the

Three Mile Island episode the only real voice of reason emanating from the U.S. Government and I think the public. In my judgment, irrespective of your views on nuclear power, I think you have shown a great deal of maturity and competence during this entire situation. I see in your own views that obviously there has been some evolution in thinking in your own mind. I think that is positive.

I would like to ask you three basic questions. No. 1, Congress has now authorized and provided funds for full-time NRC inspectors at all operating plants and plants in the final stages of construction. Can the people in this area be assured that Limerick will have a full-time NRC inspector or do they already have one?

Mr. **Denton**. We have inspectors, I think, at every site of an operating plant today and we are moving toward getting at least one inspector per plant. It is my understanding that Limerick has a resident inspector even for construction.

Mr. **Glickman**. They do have a resident inspector and that is in addition to your rotating inspector that comes from your regional office?

Mr. **Denton**. The regional office here is in King of Prussia.

Mr. **Glickman**. I am very concerned about FEMA. This is, of course, the only civil defense agency that handles disasters. To be honest with you, I think the agency is a disaster, and it worries me very much what actual role they will be given in the whole area of evacuation and preparedness.

Now I understand that both the President, as well as the Kemeny Commission report, talk about the fact that FEMA will be given, so to speak, the preemptory role in determining evacuation plans. I am very concerned that they have the capabilities, the personnel, the authorized funding level and the respectability in Government to do it. I wonder if you might comment on that?

Mr. **Denton**. They are a young agency and they do need resources. We have had a program whereby we have detailed a number of our staff members to FEMA to help them get started. But on the question of FEMA, I will refer to the representative of FEMA who is here.

Mr. **Kostmayer**. They will be testifying.

Mr. **Glickman**. In terms of the relationship between FEMA and the NRC, will FEMA have the authority to veto the operation of a nuclear plant that would otherwise be licensed by you?

Mr. **Denton**. They certainly do not hold the power, the veto power. We would rely heavily on their assessment of the adequacy of the State and local plans for evacuation and other protective measures. If they find that a plan was not adequate, then we would not issue a license. But by statute, they do not have the veto power per se. They do their assessment of State and local emergency planning and provide that to us. Without FEMA's concurrence that these plants are adequate, we would not proceed.

Mr. **Glickman**. At least, statutorily, you could go ahead and issue an operating permit, irrespective of what they said?

Mr. **Denton**. That is my understanding. I would have to refer to counsel.

Mr. **Glickman**. I suppose my biggest concern is the fact that, as I said in my opening statement, I think there is a role for nuclear power in this country, but can the public rely on the fact that for future operating permits, whether it be at Limerick or any others, there will be an evacuation plan as a condition precedent for that permit to be issued. Is that a factual statement?

Mr. **Denton.** That is the current content of our proposed rule that, before we issue a license for a new plant to operate, there must be adequate emergency plans concurred in by FEMA. We expect to make that rule final within the next month.

Mr. **Glickman.** And that would include any plant under construction right now?

Mr. **Denton.** Yes, sir. Limerick is 4 or 5 years away from being completed, so there is plenty of time to implement the proposed rule.

Mr. **Glickman.** I am not familiar, but does your rule describe in some depth what an adequate evacuation plan would be?

Mr. **Denton.** Yes, it does.

Mr. **Glickman.** OK. Thank you, Mr. Chairman.

Mr. **Kostmayer.** We recognize the gentleman from Massachusetts, Mr. Markey.

Mr. **Markey.** Thank you, Mr. Chairman.

So the audience will have somewhat of a contrast on the ideological spectrum of this subject, I do not think that nuclear power has a future in America [rest of sentence drowned out by audience]. I think that for three reasons. I think, first of all, it is not safe. I think that it has been shown that there is a much higher probability of accidents than heretofore was thought to be the case. We really do not have to run this needless risk of having nuclear powerplants. It is not economical; coal-fired plants are much more economical and competitive now than they were in the past. Nuclear powerplants have gone from $200 million for a plant in 1970 to $1.5 billion and upward to $3 billion or $4 billion which is the estimated projection by the end of this decade. Coal-fired plants are coming in at a much more economical and competitive price. The third, as Congressman Kostmayer has already pointed out, is that it is not necessary. There is a dramatic decline in the demand for electric generating capacity in this country and there is every reason to believe that with added conservation, with using alternative sources in a wise and cautions way, and having additional coal generating plants, that we could get by without additional nuclear power through the rest of this century. To some extent we are stuck with the plants that we have and we have to somehow make them as safe as we can until we can phase them out of our society.

The point is that although the assurances of the world continue to be thrown out, people do not trust the experts any more. They want to have more assurances of the likelihood that plants can and will be made safe in our country.

Can you comment to me about the proposed 15-minute warning plan which is now under consideration so that we can assure all those people who live within a 10-mile radius of the nuclear powerplant would be notified of that occurring accident within a 15-minute period of initiation?

Mr. **Denton.** That is probably one of the most controversial features of the proposed rule. A lot of State and local governments find they can provide 15 minutes, can warn people within 15 minutes, but only for those people who live fairly close to the plant and as you go out in the radius, out toward the 10-mile zone, the amount of people involved in the distance, as such, they have a lot of difficulty with 15 minutes. Obviously, what we are trying to do is to shorten the time between the plants' detection if they have an emergency and the time the people leave the 10-mile area as soon as possible.

So there are several times involved. There is the licensee's time to detect an accident; there is the time to notify State and local officials; they notify the public and the public must evacuate. The 15 minutes would set us a goal. We would like to keep it 15 minutes, but there are public comments coming in and there is a lot of sentiment that it should be somewhat longer than 15 minutes out toward the boundary of the 10-mile zone; that is, the time required for the State and local officials to get the word to people within the 10-mile zone that an emergency has occurred.

Mr. Markey. I guess what stirs me is the kind of comments that are coming in with regard to the kinds of notification the people should receive, that an accident is ongoing. From the industry's Nuclear Safety and Analysis Center, that is, the nuclear industry itself and not your agency, they recently told an advisory committee on reactor safeguards that the 15-minute requirement is meaningless and that the shortest period in which protection measures need be taken is at least 3½ hours before they notify the people an accident has occurred. The Atomic Industrial Forum comments on the proposed emergency rules and said that an analysis underway within the industry appears to show at least a 24-hour time increment between the initiation of an accident and any threat to health and safety of the public. That means they should wait a day until they let the public know. The public in the immediate vicinity might want to take under advisement of whether they might want to move their children from the immediate area and I am very, I guess this is what bothers me, that when I still see the industry in the wake of Three Mile Island, to make it safe and to give the kind of assurances to the public they deserve, why are they still offering up these kinds of almost insulting recommendations to the American people?

Mr. Denton. The power industry in this country has operated traditionally, at least from my observation, that each power company is largely independent and does not appreciate the lessons that other power companies learned. I think among many companies in the United States, I do find they do have affirmative obligation of safety that comes first and foremost. When they try to get concurrence or comments, it does sometimes reach the lowest common denominator.

Mr. Markey. Do you have any feeling right now what you think might be the more reasonable time limit to begin notification of the public?

Mr. Denton. The 15 minutes is obviously a very worst case accident, when a core melting begins and it is occurring and the pressure may be building within the first half hour, and that is what I addressed early on. We are looking at the entire spectrum of accidents from very slow to very fast accidents and the 15 minutes is the time requirement based on the worst accident imaginable where all water is lost, the core begins to melt immediately, the pressure builds up rapidly from this loss and we intend to stand firmly on 15 minutes. However, we will look at the comments that do come in to see if it makes sense. Obviously to the people who live within the boundary of the 10-mile zone, they do not need quite the same warning time as the people who live very near the plant.

The most important thing is to notify the people around the plant since they have the longest time to go.

Mr. Markey. My problem also goes to the question as to whether or not a core meltdown can occur. As you know, until the Rasmussen report was repudiated by the Lewis report to the extent it was not a valid study as to a core meltdown occurring, there really was a consensus within the industry that a meltdown just cannot occur. Nuclear powerplants pretty much precluded the possibility of that occurring, which leads to the liability limitation on the amount of insurance which is required under the Price-Anderson Act of nuclear powerplants since a core meltdown cannot occur and, therefore, we do not have to insure your powerplant for that kind of accident occurring.

Now recently in March 1980 of this year, you have indicated that you would ask for a review of accidents and emergency preparedness in light of a class 9 accident, that is, a core meltdown, and you say now that it is expected that these revised treatments would be to similar conclusion regarding the environmental risk of accidents that would have been reached by continuing their contract without including class 9 accidents. In my own mind, I think that is an erroneous assessment of the state that existed at the Commission in the time period preceding Three Mile Island, that the Kemeny Commission indicated that the personnel came into most of these situations with the presumption that a core meltdown could not occur and, therefore, we can dismiss that as a consideration that we would have to take into account when deciding what kind of preparedness we would have to build into this plant.

So I would say your judgment here is rather premature that any analysis would indicate that the kinds of preparedness which are necessary would be roughly similar to that before Three Mile Island, which would include core meltdowns, for this kind of protection.

Mr. Denton. Core meltdowns are the only accidents that pose major threat. Also, they have been considered by the NRC. As long as plants were small in size, the containment was adequate to even cope with a core meltdown. Of course, where plants were 200, 300, or 400 megawatts, the complete core meltdown would not result in a breach of containment. That was the reason for the containment. Then in the early 1970's when it was realized that containments might be penetrated or breached during a core meltdown, the Commission did a lot of study instead of beefing up the containments which were intended to prevent core meltdowns from occurring, and you are correct in that the Commission did not require an assessment on the environmental impact statements on the consequences of core meltdown accidents. The document you are referring to, which was a recommendation I made to the Commission which they adopted, is in the future, all environmental impact statements, including Limerick, will specifically cover the environmental consequences of a spectrum of core meltdown accidents on acute health effects, long-term health effects on the environment from core meltdown accidents.

Mr. **Markey**. In conclusion I would just say that I would have to disagree with you that there have been preparations made for a core meltdown accident. Before Three Mile Island, there were no real effective emergency plans in this country to evacuate within the vicinity of nuclear powerplants. Most of it was under the Paul Revere system where you went from door to door and notified people. I think that the basic tradition that had been used to prepare for emergencies was irrational and one which jumped from the premise to the conclusion without really examining any of the real facts.

Mr. **Kostmayer**. The gentleman from Nebraska, Mr. Cavanaugh, is recognized.

Mr. **Cavanaugh**. Thank you, Mr. Chairman.

Mr. Denton, I think it is easy, I guess, for us in Government, either for Congress or in the regulatory branches, to attempt to cast ourselves as the white hats here and the industry as the dark hats, but I think actually we need to share some of the responsibility for the difficulties that we now face as we approach nuclear energy as a power source in this country. A little more candidly, the fact is we did not develop the public policy that we are now propounding and castigating the industry for not adopting before Three Mile Island occurred. I think that responsibility rests with us in Congress and Congress as an institution and with you in the respective regulatory roles rather than the industry itself. I think that we sometimes mislead the public that the industry has somehow intentionally directed itself in an irresponsive and careless direction. I think that is a little too easy an out for the rest of us.

But the fact is the question of energy involves also the question of economics. I would like you to address the issue as well as you can as to how these changing and constantly changing, as you said in response to Congressman Kostmayer's question, you expect the safety standards to undergo rapid alterations and change in the immediate future. How can the industry predict the cost of these changes and, indeed, how can they proceed on any reasonable basis that they are going to get a return on their investment when what, we are 9 years into this project from construction and in excess of $2 billion in the ground and yet no license in prospect and, as you indicated, the license is in extreme jeopardy? Do we not have to settle down at some time and establish the rules of the game and is that not your responsibility and Congress responsibility rather than the industry's responsibility? When will the NRC settle these issues so that we can proceed in this country with the development of the energy resources that are necessary to meet the needs of the people?

Mr. **Denton**. Well, it is certainly true we have a process which satisfies no one. The industry thinks they can never finish the plant. The critics of the plant think there is no way to stop it. From my own perspective, the action plan, which the Commission is in the final stages of review, has just set forth our response to all the investigations of the Three Mile Island accident. It is a complete overhaul of the way we look at plants and abandons some of our cherished review concepts. We pay a lot more attention to human factors, to the control room design, we assume multiple failures as well as single failures. That document is intended by the regulatory staff to set forth the changes that are needed, and what we will be doing with plants such as the Limerick plant and other plants in high population areas and we will be applying some of the precepts of that action plan against those plants which may have gotten construction permits or operating licenses sometime ago. I hope the action plan does stabilize the process.

Mr. **Cavanaugh.** Is it going to stabilize it in a manner that is economically feasible, or is it going to stabilize it in a manner that as a cost question makes nuclear power no longer a realistic project?

Mr. **Denton.** Our charter does not get into the policy. We set the minimum standards that a plant must meet and it is up to the utility and the Public Utility Commission whether they want to build a nuclear plant or alternative energy plant. We do not play any role in changing the Nation's energy policy. We are the last people to find out that a utility wants to build a nuclear plant. They make a determination within the State and they are considering factors that we do not have the statutory responsibility for. Then they come to us for a license after they make those decisions.

Mr. **Cavanaugh.** So it is your position that the NRC has no responsibility for the added cost of energy which its rules and regulations result in?

Mr. **Denton.** Well, the Commission is mindful of the cost of the requirements, but our basic obligation is to insure safety standards, period. There is no question that a minimum standard of safety must be met regardless of the cost.

Mr. **Cavanaugh.** Thank you, Mr. Denton.

Mr. **Kostmayer.** Thank you very much, Mr. Denton. I want to thank you for your testimony today. We enjoyed having you in Bucks County. We welcome you officially to the community and thank you for coming.

To the audience, I would hope that you would exercise some restraint and would not call out rudely when you object to something that someone has said. A panel has been designed, as you have seen, to provide a variety of viewpoints from one side to the other and we are of differing opinions here.

Let me also say for informational purposes, we have now four groups of witnesses to hear from today—four panels of witnesses. The next are representatives of the consumer advocate from the Pennsylvania State Department of Justice. Then we are going to hear from Federal and local emergency planning officials, then from the utility involved, Philadelphia Electric Co., and finally from a panel of the environmental groups. Then we will go to the session where the public will have an opportunity to testify. So we will move as quickly as we can.

I call now our next panel of witnesses, Mr. Walter W. Cohen, consumer advocate for the Commonwealth Department of Justice, and Mr. Donald M. Shakow, senior economist for Energy Systems Research Group, Inc.

I have not seen your statements yet, but in the interest of time, please feel free to summarize if you like or you may read it if you wish. Please proceed.

[The prepared statement of Donald M. Shakow may be found in the appendix.]

PANEL CONSISTING OF WALTER W. COHEN, COMMONWEALTH DEPARTMENT OF JUSTICE, AND DONALD M. SHAKOW, ENERGY SYSTEMS RESEARCH GROUP, INC.

Mr. COHEN. Thank you, Mr. Chairman. The statement which we are submitting is the statement from Don Shakow, who has testified in the proceedings involving Philadelphia Electric Co. on the question of Limerick and his testimony was in part adopted by the Public Utility Commission with recent conclusion on the case. I just want to make a few introductory remarks in terms of setting the framework, which I believe brings us to testify here today and then Don on my left, who is from Massachusetts and has been retained by our office in several cases as an outside consultant to review the facts and figures submitted by Philadelphia Electric and other companies, can proceed with the testimony.

In the last Philadelphia Electric rate case, the Public Utility Commission reviewed first of all the question of whether the weather forecast for the future of Philadelphia Electric Co. was accurate in terms of the need for additional generating capacity and the Commission concluded in its opinion, which came out about 3 weeks ago, that, in fact, the company's forecasts were wrong and the forecast of Mr. Shakow submitted for the consumer advocates' office more accurately reflected a decreased need and decreased growth potential for this region in terms of electrical power, in part reflecting a movement toward conservation which is so much the responsibility both of the companies and of the customers.

Second, the Public Utility Commission made an adjustment in the submission of the company's some $25 million for what it found to be the result of our testimony, excess current generating capacity. What we then asked the Commission to do, and what they refused to do, was to conduct an investigation at the State level into the whole question of the need from an economic standpoint for the Limerick unit. We felt if you reach the conclusion, which they did, that the forecasts of the company are wrong and the company already has excess generating capacity, I believe the differential in the forecast is they saw a 2.6-percent rate of growth per year and we saw 1 percent rate of growth. So that our projection at the point of completion of Limerick under our load forecast, which is now adopted by the Pennsylvania State Regulatory Commission, our projection is a 56-percent reserve capacity in mid-1980 after Limerick comes on.

What that means is that on the peak day of the year, as I understand it as a lawyer and not as an economist or an engineer, as I understand it it means on the peak generating day of the year, Philadelphia Electric would be—sometime in the summer—that the company would have 56 percent more generating capacity than is needed. As I said, the Commission has already moved on finding that they have current excess generating capacity. The company said their forecast would show a 28-percent reserve margin, which is appropriate, although the industry standard as recognized in this day and age is considerably below that.

We come here today in somewhat of a quandary and for that reason I think I learned a lot today from hearing Harold Denton because I was not aware from our contact at counsel's office of the Nuclear Regulatory Commission that there was a proceeding of some sort that was being initiated into the question of possible revocation of the construction license or modification of the license as he said.

We are in a Catch-22 situation in the State of Pennsylvania and that is why we need to look either to Congress or to our State legislature, either to the Nuclear Regulatory Commission or the Public Utility Commission for some relief. As I said, the Public Utility Commission has said that they will not act to start an investigation into the need for Limerick. What they will do is ask the company to submit annual reports and then they will conduct a hearing 6 months before the unit is scheduled to go into operation. They say it is a Federal responsibility and that the Federal Government has preempted the whole question of construction of nuclear facilities.

As I understand it, in the case which Mr. Shakow is now involved in at the State level, that the Public Service Commission in Missouri recently petitioned the Nuclear Regulatory Commission to institute a proceeding on the question of whether the Calloway reactor was needed and the response of the NRC was it is the State's responsibility on the question of need for the facility as opposed to the whole issue, obviously, of the safety as the primary concern.

The Catch-22 is that the State has already told us it is a Federal responsibility, but we will file petition to the NRC, but expect it will be treated the same as the Calloway petition wherein they said it is the State's responsibility. I understand there is legislation before this subcommittee and the Interior Committee which would make it clear that it is a State responsibility. House bill H.R. 6390, I believe it is, and I believe this committee has held hearings on that because I had noted that the National Association of Regulatory Utility Commissions endorses that. What we need in Pennsylvania is a citing and certificate of need, a piece of legislation out of our general assembly, but we do not have it and meanwhile the Limerick plant is approaching 50 percent of completion. At the speed at which our legislature acts on matters like this, I do not think it will come up until Limerick is long completed or long down to the final completion.

Having said all that and having heard what Harold Denton has said on the questions invoked by Mr. Cavanaugh in particular and the question of economics, I believe it was, we will, through the consumer advocates' office and under what I believe is our charter from the legislature, we will seek to be involved in the proceedings in front of the director of nuclear reactor regulation to focus on the question of need because it is the conclusion, and Mr. Shakow will move to address this a little more specifically, but it is our conclusion that under a reasonable load forecast, the Limerick units, both unit No. 1 and unit No. 2, are not needed and they will cost the ratepayers $400 million to support unneeded generating capacity.

Now I understand that the company's position is that, in fact, not to build the units would cost the ratepayers $400 million a year which comes down to $75 a year for the 500 kilowatt-hours per month per customer. We are talking in big figures. One of us has to be wrong, but I cannot believe from the statement that $75 a year or $400 million a year for the entire group of customers would be saved, I cannot believe that there is a vision that the rates are going down. The company has indicated that they will seek $600 million in additional rate relief as they attempt to put these units on and if, in fact, the units are not needed, and that is our position, then somebody has to address this question and look at the economics in addition to looking at the safety elements that are involved.

We see our role through what the State legislature did when they created a State Consumer Advocates' office and that role would be a role to look at the economics. We have done that and we thought we almost got to where we should be with the State Public Utility Commission, but we were unsuccessful. We will attempt to bring that matter back to them, but meanwhile we need some look from the Federal Government and if Mr. Denton is giving it, our office will be there because we have reached the conclusion that the Limerick plant should not be completed and that even if the entire cost right now, the entire amount of money put in, were charged to the customers, it would be cheaper for the customers to pay that as a loss than wait until the plant goes on and pay for the cost of operation, the entire capital cost of construction.

Don Shakow has submitted prepared testimony and will speak from that at this point.

Mr. **Kostmayer**. Thank you, Mr. Cohen.

Mr. **Shakow**. Thank you. My name is Don Shakow. I am currently assistant professor of economics at Clark University, Worchester, Mass., and senior economist for Energy Systems Research Group, Inc., 120 Milk Street, Boston, Mass. Over the past 5 years I have done considerable research and have acted often in a consultant's capacity in the areas of electric utility systems planning, energy usage, and demand forecasting. In addition, I am the originator of the ESRG energy system generation expansion model which calculates for an electrical supply system the optimal generation expansion path over a specified planning period, as well as estimates of the reliability and social cost of any expansion scenario. This model has been employed or is presently being employed in the analysis of utility systems in Michigan, Pennsylvania, Ohio, West Virginia, Missouri, and Idaho.

On November 13, 1979, I submitted testimony before the Pennsylvania Public Utility Commission on behalf of the Pennsylvania Office of Consumer Advocates. My testimony concerned an independent analysis of optimal generation expansion plans and reliability criteria for the Philadelphia Electric Co.'s system and an assessment of the current company planning strategy and its probable impact on customer cost of electricity. This testimony addressed more particularly alternatives to the completion of the Limerick nuclear plant and associated impacts for ratepayers. On April 16 of this year I was invited to testify before you this morning on the issue of Limerick. In the testimony which I have referred to above, I concluded that the present construction program of the Philadelphia Electric Co. is likely to engender costs to consumers which are excessive, relative to rates under an alternative program. This alternative program would require five new intermediate size coal units of 300 megawatts each.

Under this program, construction of the two Limerick units totaling 2,100 megawatts appears problematic. Construction of the latter unit in particular seems ill-advised. I also concluded that the reserve margins of 27–28 percent being advocated by the company for the 1980's are excessive and are moreover not required to insure reliable service. To achieve a partial blackout reliability of less than 1 day in 10 years by 1987, reserve margins of 14–22 percent are likely to be adequate.

Today, rather than discussing the precise costs estimates for the Philadelphia Electric Co. construction program which I derived through the application of the ESRG model, I would like to address some more generic issues which arose time and again in the course of my analysis of generation systems. In particular, the planning practices of the Philadelphia Electric Co. show a number of methodological biases which are common to other utilities as well. In consequence, the application of optimization codes by utilities and the presence of these biases yield results which are generally favorable to large base load generation and to nuclear generation in particular. I would submit that the customer interest dictates a need for greater awareness of a vigilance toward these methodological practices. The methodological biases which are referred to include the following:

1. The computation of nuclear fixed costs on the basis of architect/engineering studies, as opposed to historical analyses.

2. The specification of reserve margins on the basis of arbitrary probabilistic criteria which do not account for the economic tradeoffs between energy unserved and excessive capacity.

3. The tendency to confound considerations of reliability and cost optimization, which leads in turn to the misapplication of older base load plants.

4. The presumptive assumption of regulatory practices favorable to investor interests; as a consequence a misassessment of social costs associated with the cancellation of facilities presently under construction.

Allow me to elaborate on each of these issues in turn.

Nuclear cost estimates: Recent revisions in the assessment of nuclear cost by technical experts have greatly altered the economics of nuclear plants in comparison to alternatives. Nonetheless, many utilities in their planning persist in using outmoded estimates. The Philadelphia Electric Co., provides a typical instance of a utility using such estimates. More particularly, earlier cost estimates were undertaken by architect/engineering firms chiefly from the standpoint of idealized plant designs, without accounting for the historical experience of facilities currently in operation. It was tacitly assumed that after an initial shakedown in which costs were incurred due to the novelty of the technology, the construction and licensing would become more systematized. Actual costs as a consequence were then expected to approach theoretical design-based estimates. On the contrary, nuclear capital costs had continued to escalate and no end to the shakedown phase appears in evidence.

Table 1[1] provides evidence of the disparity between architect/engineering studies of nuclear costs and historically based costs. Utilizing statistically based estimates, the nuclear alternative appears less favorable relative to coal and other base load technology.

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[1] Table 1 may be found in the appendix on page 152.

The use of probabalistic reliability criteria: A large number of utilities, including the Philadelphia Electric Co., established reliability criteria for their systems a priori, without accounting for the economic costs and benefits of these criteria. The most widespread is the 1-day-in-10-years criterion which specifies that capacity plus imports should be unavailable to meet system requirements on an average of no more than 1 day in 10 years. The origins of this parameter are shrouded in mystery. Little justification is generally provided for its use other than hortatory statements on the need to avoid blackouts.

While blackouts impose substantial costs on society, it is necessary to appreciate that the excessive construction of power generating facilities is also costly and that these latter costs are frequently borne by those least able to afford them. What is required is an explicit comparison of blackout costs with costs of additional capacity.

In my study of the Philadelphia Electric Co., the application of a social cost rather than a loss-of-load probability criterion resulted in a choice of a reserve margin 10 percentage points lower than that projected by the company. More important still is the observation that in light of my use of social cost reliability criterion, the cost assumptions associated with unserved energy were made explicit; the cost of averting blackouts, voltage reductions, and load curtailments were specified directly. My choice of a reserve margin was open, therefore, subject to criticism and further analysis. A comparable economic analysis of the company's reserve margin would present great difficulty.

Cost optimization versus reliability: The common plea among utilities is that nuclear powerplants and other large power facilities should be built in order to avert the possibility of future shortfall. However, the association between nuclear plants and system reliability is highly misleading. Table 2,[2] taken from our recent testimony before the Pennsylvania PUC, indicates that the choice among alternative base-load plants is largely unconnected to the reliability issue, but concerns only the question of relative costs. As the reserve margin for the Philadelphia Electric Co., is increased and the system becomes more reliable, the model introduces more peaking facilities into the mix. Such facilities require very modest initial expenditures, but are expensive to operate especially in light of escalating oil costs. However, the high operating cost imposes only a modest cost penalty overall since the plants are utilized only at times of unusually high demand—perhaps only for 200 to 500 hours of a year. These peaking plants are thus able to insure reliable service at modest cost.

It should be noted moreover that the present Philadelphia Electric Co., mix contains a large number of peaking units and that the construction of additional units of this type are, for the most part, uncalled for. I conclude, therefore, that the Limerick facilities cannot be justified on the basis of reliability. Moreover, as I have indicated above, a cost comparison of Limerick relative to alternative base load technologies appears unfavorable to Limerick. I have recommended, therefore, that the Limerick units be reconsidered.

Regulatory practice: The potential slippage, cancellation and/or suspension of large, multibillion-dollar generation facilities is unprecedented in the history of the electric utility industry. These possibilities impose serious problems for regulatory agencies. In particular the question arises as to who pays the costs incurred by canceled powerplants. It can be argued that the utilities are responsible to the public for their planning practices, many of which are extremely complex technically and hence opaque, except to the trained observer. When the cancellation of a facility presently under construction is due at least in part to miscalculations in the utility planning process, it is reasonable to impute a fraction of the cost of cancellation to the utility.

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[2] Table 2 may be found in the appendix on page 153.

At present, utilities in their planning do not allow for this possibility. They assume, in fact, that the ratepayers will incur all costs associated with canceled facilities. As a consequence, the social costs of completing facilities such as the two Limerick units are estimated as equal to the incremental costs of these plants, that is, to the sums which are yet to be expended prior to completion. Were the costs of the canceled plants imputed to the company, the costs to consumers of completing the plants would equal the full rather than the incremental costs of the plant.

The planning consequences of using incremental rather than full cost assumptions can be substantial. In my analysis of the Philadelphia Electric Co., I found that based on the company's assumptions as to nuclear capital costs, the imputation of full rather than incremental costs would imply the selection of intermediate coal facilities in preference to the Limerick units. The assumption of favorable regulatory treatment and the inclusion of the Limerick units within the plant mix appears thus to be mutually reinforcing.

Aside from these instances of technical bias, I and my colleagues have come across cases of more flagrant-bias cases which I might note do not involve the Philadelphia Electric Co. My colleague, Dr. Richard Rosen has found that a group of utilities in western Pennsylvania and Ohio selected a generation mix weighted toward nuclear, despite the fact that their own calculations showed a coal-weighted mix that was relatively lower in cost. I and my colleague Dr. Dennis Duscik of Clark University discovered a similar result in examining certain long-term planning documents of the New England utilities. I mention these instances of planning bias not so much to call into question the wisdom of continuing the construction of the Limerick units but rather to observe the question of planning bias more generally.

At present the average citizen and ratepayer has little access to or control over planning decisions which involve billions of dollars and which affect him subsequently in the form of escalating electricity rates. Such planning decisions, in my opinion, reveal systematic flaws which are in principle subject to formal criticism and redress. The elimination of these flaws would require fundamental changes in existing planning practices as regards electricity supply and a particular change in the level and quality of public sector participation in electrical system planning practices. In my judgment, an exploration of possible reform in this area is overdue.

Mr. Kostmayer. Thank you very much for your testimony. Let me ask a couple of questions.

You took your case regarding excess reserve capacity to the Public Utility Commission. The case was heard by an administrative law judge and he rejected it on February 28 of this year, although he did say that the Consumer Advocates' argument deserved further study and the arguments of the Philadelphia Electric Co. were substantially upheld. I wonder if you could, in your own point of view, explain why they reached a decision contrary to what you told us this morning.

Mr. COHEN. That was the initial review of the administrative law judge and the Public Utility Commission came out with an opinion on May 9, which reversed that, but I cannot really tell you much about their thought process.

Mr. KOSTMAYER. They reversed it entirely?

Mr. COHEN. They saw the light. They did as to that part of the case. They, in fact, awarded the company $10 million more in rate relief than the administrative law judge recommended, but that was based mainly on the escalation of interest rates, I believe.

Mr. KOSTMAYER. Let me ask you another question about reserve capacity. Is it fair to call it reserve capacity; is it in a final analysis going to be used to replace plants generated by oil and is it really reserved in that sense, does it remain reserved or does it eventually go toward replacement?

Mr. SHAKOW. I think that is an interesting point. There really is two kinds of capacity. One is what is commonly referred to as base load capacity, that is, capacity typified by very large relatively efficient plants that operate a large percentage of the time.

The second type of capacity is what is generally called peaking capacity and these comprise relatively small units of relatively low capital costs, but high operating costs.

The only plants in question that are using oil and that are contemplated for the future, there are some larger oil-fired facilities currently on line built prior to this date, but as far as future capacity is concerned, we are addressing non-oil fired capacity for baseload purposes. Oil-fired capacity employs primarily peaking purposes.

The comparison between coal and nuclear that we undertook refers primarily to the baseload components of the mix. If one makes a comparison of plants that are to be used primarily for baseload purposes, that is, to service that portion of the load that would be required most of the time, a substantial fraction of the hours during the year, in our judgment, the coal option is superior from the cost standpoint than the nuclear option.

Mr. KOSTMAYER. Thank you.

The gentleman from Kansas, Mr. Glickman, is recognized.

Mr. GLICKMAN. I want to thank you both for your testimony.

I want to assume for a moment that the Limerick plant and other plants like it may not be needed from an economic point of view, that your evidence is correct; the plant was designed years and years ago before anybody ever heard of the problems of nuclear power; before anybody ever heard of OPEC and what it could do to us; before anybody ever heard of the inflation rate we have and in the meantime this utility company, as well as others all over the country, have gone out and issued billions of dollars worth of bonds because in most areas of the country they cannot finance the plants through rate increases. In the interim, we decided: (a) Nuclear power is not a feasible choice or; (b) Economically it just will not cut the mustard.

Do you have any suggestions about how we are going to prevent the catastrophe of bankruptcy of utility companies all over America? Because I think that is a logical conclusion to follow. I do not think anybody in the audience really wants the utility companies to go bankrupt. I am not sure you want Uncle Sam running all our power companies in America.

What I am saying is how do we handle that particular problem and avoid shoving it to the ratepayer to have to pick up those costs or is it just an unavoidable situation?

Mr **Cohen**. Mr. Glickman, we face that question much more closely and directly with the Three Mile Island situation. There is no easy answer to it. I would say that we attempted by retaining an outside consulting firm in New York City to review the whole question of alternatives in the Three Mile Island case, alternatives to continued operation of Metropolitan Edison and what we feared would be astronomical rate increases that are now on the way to those customers. We could not conclude that bankruptcy was a feasible alternative or that a merger of companies together would make it better for the ratepayers, but we could not conclude that bankruptcy would be devasting.

We did not put on any testimony and we as advocates to the consumer do not have any expert testimony to put on that will support you that bankruptcy is to be encouraged or to be supportive, but I cannot say there is testimony to the other side that says that bankruptcy is a total disaster.

Mr. **Glickman**. As I understand it, this Limerick plant is somewhat unique because this plant, when completed, will double the capital investment of this company. I do not think Metropolitan Edison was anywhere near that in terms of that one plant at Three Mile Island versus their entire operation.

My only point being that I am not sure I disagree with you on the merits, but it shows how institutionally difficult it is to develop capital intensive energy products. Whether it is coal or nuclear or large scale photovoltaics, which may be a bit expensive and take a period of years and years of regulatory problems and other kinds of environmental problems, you could come to the day of reckoning where it is not going to be useful. I am just saying that the public of this country, like they did in the Chrysler situation, may be forced to foot the bill whichever way we go. Again, I do not think the public should be misled on that point.

Mr. **Cohen**. I agree with what you are talking about and I think we have to draw the distinction between the public as ratepayers of the company and the company as taxpayers. The Public Utility Commission in its recent opinion of Three Mile Island called on the Federal Government, called on the President, called on the Congress to be responsive to what they saw as an actual disaster, so to speak, or a disaster of the same level of other kinds of problems where Federal intervention has been necessary. In fact, they made the statement if there is no Federal intervention of that type, the eventual rate the ratepayers will have to pay for those companies will be prohibitive or astronomical or some words like that. I think that it may be that we are going to have to look to the Federal Government, look to a spreading of the risk.

Our testimony on Limerick goes to the question that we should not be looking for the ratepayers of the company because of the mistakes of the company. Even if we did not have the expertise as consumers, I was not around 10 years ago on this issue and I do not pretend to have the credentials to say I knew back then. But what I am saying our position has to be, I think the ratepayers cannot bear the entire burden for construction of plants that are no longer needed. Maybe the taxpayers have to. I am not arguing you the company should. In fact, I never made that statement and Mr. Shakow's testimony usually looks at the whole question of what the cost would be if the ratepayers do take the whole burden because that usually is what happens.

We concluded that it is still cheaper for the ratepayers to bear the entire cost of cancellation than to bear the cost of construction.

Mr. Glickman. Does your study on excess capacity contemplate a capacity in, let us say, a regional good electric grid for not just southeastern Pennsylvania, but for the entire area? I assume this plant will be contributing power into an area and not just into a smaller quadrant. Does it include additional coal-fired plants being built and the negative environmental impact of those coal-fired plants?

Mr. Shakow. The study addresses just the Philadelphia service company components of the regional grid. Of course, insofar as Philadelphia Electric Co. is a major factor within that grid, excess capacity naturally will contribute to excess capacity grid overall.

In regard to environmental costs, there are some costs imputed to potential retrofits of coal plants in light of future environmental standards. Generally speaking, the assumptions that we employed are, from our point of view, conservative in the sense that we do not speculate about the social costs that may occur external to the general market or regulatory mechanism.

Obviously, if you are to repute costs in addition to those which are very clearly anticipated in terms of environmental regulations, then the ultimate result will still be less favorable to coal than it is right now.

Mr. Glickman. Have you found the construction costs of large-scale coal plants to be inflated and about the same amount as a nuclear plant or less so?

Mr. Shakow. No; I would say typically less so.

Mr. Glickman. You mean the rate of inflation is less so?

Mr. Shakow. The rate of inflation is less and the regulatory factor is obviously very, very critical.

Mr. Glickman. OK; the last question relates to the question of preemption, which I think Mr. Cohen raised, and that is who should actually have control over the siting of plants? And we see the Federal Government involved with safety issues. We saw the same problem on waste disposal in my own State of Kansas. We are fighting the use of a salt mine as a repository for both low and high level waste arguing that it should be a State and not a Federal decision. The problem of that, and being a bit of a devil's advocate, is everybody wants it in everybody else's backyard and not their own. It is a little like balancing the budget, do not touch me, touch the other fellow.

I wonder how you can reconcile those two issues. You know obviously safety of nuclear power is a national issue, not a State issue, but sometimes they are regional issues. If we would give the States exclusive authority over siting and licensing, are we avoiding an eventual problem when the Feds have to take it over anyway? I would like your response to that.

Mr. COHEN. I am not sure I have a wise response to that. I think the States should consider the question of need and the question of siting, so that I do think that, and it is being done in about 35 out of the 50 States. Pennsylvania is a State that does not have any mechanism of consideration of the need for generating equipment of any kind or for the siting of such plants. I think the States have to get into the business completely, but I would still assume there would have to be some Federal overlay because of the issues of safety and where that would come out, I really do not have a good suggestion.

Mr. GLICKMAN. Thank you.

Mr. KOSTMAYER. The gentleman from Massachusetts is recognized.

Mr. MARKEY. Thank you, Mr. Chairman.

What you are saying is in 1980 it is more economically wise to build a coal-fired plant than build a nuclear plant; are you saying that?

Mr. SHAKOW. For the Philadelphia Electric Co. system, the results of our analysis would be consistent with that statement, yes. We have not analyzed all the utility systems in the country, so I cannot make a statement in any general way. What I tried to point out today was that a number of biases in the analyses typically performed by the utilities do tend to lead the utilities in the direction of nuclear plants.

So that insofar as these biases are general and widespread among utilities, we would find the application of bias analyses in favor of nuclear plants.

Mr. MARKEY. If you started off with the presumption that a core meltdown could not occur, that you did not have to build in additional safety measures which are going to be required per Three Mile Island and you did not have the additional burden of emergency planning, if there was not going to be more additional burden placed upon you from the Regulatory Commission and the political problems nuclear powerplants run into, perhaps it was not that bad a projection other than the fact that they were not being very objective and they were just taking all of these things for granted rather than assuming that some of them cannot be solved.

Now we reached a point in 1980 where a lot of people are saying if you do not build this nuclear powerplant, how are we ever going to teach the ayatollah a lesson and is that not what is going to happen to our country? We are not going to have this nuclear power to teach those Arab nations a lesson.

So the fact is the real debate in our country is not between oil-fired generating plants and nuclear plants because we are never going to build another oil-fired plant. As long as our country lives we are never going to build another oil-fired generating plant. The debate for the future is between coal-fired plants and nuclear-fired plants and which are we going to build.

Your economic analysis would indicate, at least for the Philadelphia area especially with its proximity to the source of energy which would be used by this method, that coal might be a better source.

I note you do not even address this question in your statement, but the question of acid rain, for example, what kind of additional protection does [rest of sentence drowned out by audience].

One of the interesting, I think, dilemmas that many people who are, let us say, against nuclear power really have to support something. You cannot be negative and you cannot say I do not support some form of generating energy. You have to be in favor of something and I guess that is where I come down. I come down in favor of coal.

Mr. SHAKOW. The reason for that is that a new coal-fired generating plant produces less acid rain, less pollutants in the atmosphere than does the oil plant, although many people think that oil is clean and pure and economical. In fact, it is dirtier than our coal-fired plants with all the additional scrubbers and protections that are built into it. So we do have that opportunity as well as going to coal and knowing that it is very clean.

Dirty coal is ancient history. We can mine it safely and burn it cleanly if we wanted to make the final changeover.

I thank you for raising that question of coal because I think it is very important to the people to understand a lot of those technologies.

Mr. MARKEY. Thank you.

Mr. KOSTMAYER. The gentleman from Nebraska, Mr. Cavanaugh, is recognized.

Mr. CAVANAUGH. Thank you, Mr. Chairman.

Mr. Shakow, how many utility systems have you analyzed?

Mr. SHAKOW. Approximately six. We analyzed at least one powerplant in addition to various utilities in that approximate number.

Mr. CAVANAUGH. In those, how many have you found that nuclear would be an appropriate economic energy resource?

Mr. SHAKOW. None.

Mr. CAVANAUGH. In response to Mr. Markey's question, you said you could not say in no case could it be an appropriate economic energy source. So instead of your experience, you still believe that it is?

Mr. SHAKOW. I cannot make any blanket statements at the moment in regard to the economics of nuclear vis-a-vis coal. For all utility systems, there are many local factors that might turn out to be relevant. For example, transportation statistics might have an adverse effect on the cost of coal in particular sites.

Nonetheless, insofar as the economics of coal and nuclear relate to national market and insofar as national considerations determine the relative prices of nuclear and coal, I think our work thus far does support the observation that coal-based generation operations seem to be, at least insofar as we can determine, more economical than nuclear.

But before pursuing the analysis on a wider basis, I would not want to come out with a blanket statement in support of one technology.

Mr. CAVANAUGH. In the six other systems, could you list those for the committee?

Mr. SHAKOW. The Detroit system, the western Pennsylvania, Penn Power, the Missouri Electric Co., the Idaho Power Co., West Virginia—I cannot recall the name of the utility there.

Mr. CAVANAUGH. In the case of those system analyses, who was your employer; who paid for your services?

Mr. **Shakow.** Different groups in various cases. Typically State agencies, and not necessarily consumer-related offices. In some cases, in the Idaho study I believe, it is the Public Service Commission, but that has not been completed yet. But typically State agencies.

Mr. **Cavanaugh.** In the case of Idaho, you have not yet considered nuclear as not appropriate?

Mr. **Shakow.** That is right. The object of that study really is to offer some insight into the design in terms of curtailment practices rather than get a bottom line on nuclear versus coal. It has a different purpose.

Mr. **Cavanaugh.** Have you had an opportunity to review the testimony of Mr. Vincent Boyer, senior vice president of the Philadelphia Electric Co.?

Mr. **Shakow.** Yes, I have.

Mr. **Cavanaugh.** He makes some statements here that I assume you disagree with. On page 3, he says, "Limerick on line will save Philadelphia Electric Co.'s 1.3 million customers about $430 million per year." Do you understand the basis for that statement?

Mr. **Shakow.** Well, I have not reviewed the precise numerical calculations, so I cannot claim to understand the precise basis of that statement. I am, however, generally familiar with the cost-related assumptions applied by Philadelphia Electric Co.

Mr. **Cavanaugh.** As briefly as you can, can you describe to the committee why, in your view, this is not an accurate statement?

Mr. **Shakow.** Yes, I alluded to some of the reasons in the testimony which I presented today. For example, in the estimate of plant costs employed by Philadelphia Electric Co., and you can refer to table 1 of my testimony in order to get a more precise quantitative motion of what the assumption implies, you will note that the Philadelphia Electric Co., employing what I term the architectural/engineering approach, estimating the cost to be $1,478 per kilowatt. By contrast, my analysis shows that a nuclear facility coming on line in 1990 would cost approximately two times that amount. Our analysis relies on statistical review of construction costs data for nuclear facilities presently on line.

So it refers to a historical analysis rather than an analysis of plants from an engineering standpoint. Obviously when you repute the capital costs for a nuclear plant twice as great in one analysis as compared to another analysis, the bottom line is going to come out quite different.

I do not want to review all the various assumptions that create the difference and the ultimate conclusion of Philadelphia Electric Co. as opposed to my own analysis, but I think a comparison of capital costs suggests the typical instance of the disparity in the cost estimates between myself and Philadelphia Electric Co.

Mr. **Cavanaugh.** What is your bottom line capital cost of the Limerick unit?

Mr. **Shakow.** Perhaps I can read from my testimony here. I claim that the use of the PECO procedures and assumptions implies a cost penalty of $1.4 million in levelized 1979 dollars over the common decade.

So what that means is if we employ the Philadelphia Electric Co.'s plant mix, but our assumption, then we emerge with a $1.4 billion penalty in using their mix as compared to our recommended mix over the decade of the 1980's.

So that is our bottom line in terms of overall cost for our recommended construction program as compared to the Philadelphia Electric Co.'s construction program. This is due to a difference in the capital cost estimate of $1,478 of the Philadelphia Electric Co. as compared to $2,887 per kilowatt in our case. So that is the bottom line, but the latter estimate of the bottom line capital cost, that is the cost of construction per dollars per kilowatt, the $1.4 billion refers to overall cost incurred through the application through the PECO construction program compared to our construction program.

Mr. CAVANAUGH. What was the level of cooperation that you received from Philadelphia Electric in the course of your analyses?

Mr. SHAKOW. We submitted formal interrogatories to the Philadelphia Electric Co. in which we sought data that would be of relevance in running our model and generally speaking, we had a few problems in getting this data. So much of the data regarding the technical characteristics of the plant were actually provided by the Philadelphia Electric Co.

Mr. COHEN. If I may add to that, we asked for updated figures and the degree of cooperation is much less now than it was before the initial review.

Mr. KOSTMAYER. Thank you. I think that Congressman Glickman has a followup question.

Mr. GLICKMAN. I just want, for the record's purpose, to get the relationship between you two. As I understand it, you are an associated economist with a corporation in Massachusetts that apparently does consulting; is that correct?

Mr. SHAKOW. I teach at Clark University and I subcontract with a consulting firm located in Boston, Mass.

Mr. GLICKMAN. And you were hired by whom, the public utility commission or the office of consumer advocates?

Mr. SHAKOW. The consulting firm was hired by the office of consumer advocates and I subcontract to them.

Mr. GLICKMAN. Would you mind telling us what your fee was?

Mr. SHAKOW. Well, I receive a senior research salary from this consulting firm.

Mr. GLICKMAN. Do you know what their fee was?

Mr. SHAKOW. The fee to the consulting firm from the Consumer Advocates to the consulting firm?

Mr. GLICKMAN. That is correct.

Mr. COHEN. I can supply that information because it is public record because it is a contract and it is bid out, so it is no secret, but I do not have it in my head.

Mr. KOSTMAYER. Thank you very much, gentlemen. We appreciate your testimony.

The committee will stand in recess for 10 minutes.

AFTER RECESS

Mr. KOSTMAYER. If the subcommittee will come to order.

Some people asked about a lunch break. We are not going to have one. We are going to go through in the interest of time. We ordered sandwiches and we are going to have them up here. We are going to go right through.

Our next panel is Mr. Sam Ely, director of Montgomery Emergency Management Agency; Mr. Charles McGill, coordinator for the Bucks County Emergency Planning; Col. Oran K. Henderson, director of the Pennsylvania Emergency Management Agency and Mr. John McConnell, assistant associate director for Population Preparedness of the Federal Emergency Management Agency.

Gentleman, I do not know whether you have prepared testimony which you want to read. I hope you will feel free in the interest of time to summarize your testimony if you wish so we have more time for questions. First introduce yourselves from left to right.

[The prepared statements of Sam Ely, Charles McGill, Col. Oran Henderson, and John McConnell, may be found in the appendix.]

PANEL CONSISTING OF: SAMUEL L. ELY, DIRECTOR, MONTGOMERY COUNTY OFFICE OF EMERGENCY PREPAREDNESS AND MEDICAL SERVICES; CHARLES L. McGILL, DIRECTOR, EMERGENCY SERVICES, BUCKS COUNTY; ORAN K. HENDERSON, DIRECTOR, PENNSYLVANIA EMERGENCY MANAGEMENT AGENCY; AND JOHN W. McCONNELL, ASSISTANT ASSOCIATE DIRECTOR, FEDERAL EMERGENCY MANAGEMENT AGENCY

Mr. McGill. Thank you, Representative Kostmayer. In response to your inquiry, I would like to read what I have addressed to you and likely you have not received it at the present time.

Bucks County has emergency operations planning supported by standard operating procedures. The plan was revised and updated and has State approval as of April 1980. The Emergency Management Agency has two professional employees as well as clerical people. Two persons are responsible for planning. Two trained volunteers in radiation effects are immediately available. There are approximately 200 volunteers trained in radiation detection. There have been discussions with State officials in reference to the Limerick plant. We have received no specific directives at this time. We know they are coming and we know our area of responsibility. We have had no direct contact from Federal or utility officials.

Mr. Reiter is director of the emergency management agency and that is supported by an emergency management executive full time. An experienced executive volunteer, a full-time professional retired on May 1, 1980. The two executives have received extensive training by State and Federal civil defense organizations in radiation detection monitoring and radiation effects. The director's training in this area is less than the executive, but still extensive. The director has had 18 years of experience in disaster planning and response. The combined experience of the two present emergency management personnel is 22 years and adding the experience of the recently-retired volunteer, there is a total of 36 years of disaster planning and response available to Bucks County.

There are presently about 100 radiation monitoring stations established in Bucks County, two trained monitors and detection equipment to each station. Reporting is to the county emergency management agency, then to the eastern area office of the State emergency management agency in accordance with established protocol. The State teletype warning and communications system is used.

Under emergency conditions, six persons trained to the level of radiological defense are available to provide crash programs in radiation detection. It is an 18 hour course. Fifty sets of radiation detection equipment are available for distribution to trained personnel to support the detection efforts.

Direct contact with the few county radio stations as well as stations in Lansdale, Trenton, and Philadelphia can be used to disseminate information and instructions. The treatment of contaminated persons by county hospitals is understood and can be accomplished. Long-term treatments of radiation sickness can be adequately handled by all of the seven county hospitals.

Mr. **Kostmayer.** Thank you very much.

Mr. **Ely.** Congressmen, I think maybe I will explain a little bit about civil defense for emergency management so that somebody might not feel we are too far back in the times. I think you are probably speaking of the least expensive way of spending your money if you are able to protect the people of your community.

Our civil defense county consists of a police chiefs' association, fire chiefs' association, consists of 93 companies in Montgomery County, 12,000 volunteers, 52 separate police departments, the State police, the county detectives and the sheriffs. Also, the Planning Commission, the Ambulance Association with 2,500 members and 85 ambulances, the hospital directors, 11 hospitals, the community college, the intermediate 23 school units with over 250 schools at our disposal, the American Red Cross, county agency facilities and assessments and purchasing assessments that go out and check damages after storms. I just wanted you to know what the civil defense or what the Emergency Preparedness Department does include.

In June we had a problem down at TMI. On Sunday, I was called and one member of my staff. At that meeting we were asked to get prepared to handle 10 to 20,000 people. We went home on Sunday and talked to our communications department and had the county organized by Tuesday afternoon. We had a plan with the use of 20 schools to handle 500 people each, to be able to feed them as well as shower them and take care of them. We had plans made to be handed out by the sheriff of the General Electric plant and that was done in 3 days.

I think our problem is it would be nice to be able to have something like this ahead of time and it seems to me we have a lot of time right now if we are talking about 1984 or 1985 to get a plan on the road.

Mr. **Kostmayer.** You mean State plan?

Mr. **Ely.** Yes, State plan.

I think rather than to read all through the prepared statement that I have, I am going to give a summary.

This plan, I am talking about the plan that we made for the Limerick plant, must be a cooperative venture from the State, Federal, local and county governments. I would think that a plan by now would have been developed by the Federal people that would cover the details needed for a nuclear plant accident. That plan should be able to be amended to cover different terrains and populations. This would give us a sound basis to start with. It is important to know who will do what at the State and Federal levels, such as traffic control, police, security, Federal levels, National Guard. Who addresses the nuclear medicine problem, sickness and burns? We at the local and county governments are looking for direction and guidance on this.

We were told at the recent NRC meeting in New York that $90 million was allocated for planning in the 40 States with nuclear plants. Some of this money, hopefully, will go to our level of planning. The Federal and our local input should be in equal partnership with no blind shots.

Thank you.

Mr. Kostmayer. Thank you very much.

Colonel Henderson. Mr. Chairman, I have given you copies of my prepared testimony and I am going to summarize it by hitting on a few of the high spots.

Mr. Kostmayer. Colonel, you are the director of the Pennsylvania Emergency Management Agency.

Colonel Henderson. That is correct, sir.

The Pennsylvania Emergency Management Agency functions as a semi-independent agency under the office of the Governor. In Pennsylvania, each political subdivision is required by law to have an emergency management organization. As you are aware, we have some 2,636 political subdivisions within the Commonwealth of Pennsylvania. Each of these organizations has an emergency management coordinator who is appointed to his or her post by the Governor based upon the recommendation of the elected officials.

Within the Commonwealth, there are four presently fixed nuclear facilities with two additional under construction and scheduled to come on line in 1982 and in 1985 Limerick.

Planning for the Commonwealth response to emergency nuclear instances at fixed nuclear sites has in the past been the responsibility of the Department of Environmental Resources. In 1975, the Department of Environmental Resources forwarded its plan to the Nuclear Regulatory Commission. The NRC did not concur with this plan. The plan was revised in September 1977, however, it was not formally submitted to the Nuclear Regulatory Commission. The 1977 plan, however, did provide the basis for the Pennsylvania Emergency Management Agency, my agency, to issue an annex for fixed nuclear facility instances which was in effect at the time of Three Mile Island.

County plans in support of the State disaster operations plan were also in place and had been reviewed and updated during the summer and fall of 1978. One of the fallacies of all our planning was we were planning based on our instructions from NRC at that time, which was to prepare plans for possible protective action within a "low population zone." At Three Mile Island this measured out to be approximately 2.2 miles. All of our plans in order to standardize within the Commonwealth had included, had gone out to a range of almost 5 miles.

We experienced during Three Mile Island in many respects the same kinds of problems that we experience under each and every disaster with which we are faced. The only difference being primarily the degree and magnitude based upon the condition which could not be seen, felt, smelled, tasted, and so forth.

Here are some of the lessons we believe that we learned. We can no longer take for granted that nuclear powerplants are safe. Our planning should not treat them as merely an extremely remote possibility. We need to obtain a plan for the use and dissemination of potassium iodide. We need to increase our attention to the handling of people under special cares in homes, hospitals, and institutions. We need to improve the educational level of all segments of the public as it pertains to nuclear radiation. We need a fully integrated and adequately redundant warning and communications system in place. We must do a better job of bringing county and local government officials into the decisionmaking process. We must recognize emergency management's dependency upon volunteers and volunteer forces and understand they may not always be available. We must improve our capacity for handling the news media and insuring their continuing responsibility for the dissemination of factual information during periods of disaster. We must develop a more formalized system for tests and exercises. Our planning efforts must insure total integration in all levels of government and between these levels of government. We need a national level plan that identifies Federal resources and tasks Federal agencies. We need to standardize procedures for the systematic study of the social, economic, and health aspects of an accident, and we need to improve our recordkeeping.

At the present time, our State plan is into the Regional Assistance Commission, which is headed by a chairman from the Federal emergency management organization. It is presently undergoing review. We are placing priority in order of Three Mile Island, Peach Bottom, Duquesne Power and Light near Pittsburgh, Berwick, and the fifth will be the Limerick plant.

Thank you very much.

Mr. KOSTMAYER. Thank you very much, Mr. McConnell.

Mr. McCONNELL. Mr. Chairman, I also presented a prepared statement, which is somewhat duplicative of the statements Mr. Denton made earlier, so I will summarize some of the high points.

The Federal Emergency Management Agency is, in fact, a rather young agency. It was formed in 1979 as a result of Presidentially presented and congressionally approved reorganizational plan No. 3. It combined the functions and people from five existing agencies which were in other departments of Government.

The director, John W. Macy, Jr., reports directly to the President. The bywords for the Federal Emergency Management Agency are preparation in the form of comprehensive emergency management in order to prepare both the Federal Government, and the State and local governments to react to any type of emergency that may exist. The comprehensive emergency management term was arrived at so as to define all aspects of emergency preparedness and recovery from mitigation to preparedness to response and recovery.

The charter which gave FEMA a role specifically in the nuclear powerplant accident emergency planning became precise when the President on December 7, 1979, among other statements with regard to the results of the Kemeny report, made FEMA responsible, insofar as the executive branch is concerned, as lead agent for offsite emergency preparedness of State and local governments.

Of this series of responsibilities, I will recount the main ones. Besides taking the lead for offsite emergency planning and response, FEMA was to complete by June 30, 1980, the review of each State's emergency plan in those States with operating reactors, and to complete as soon as possible the review of the States' emergency plans in those States that plants are scheduled for operation in the near future.

We are to develop and issue an updated series of interagency assignments, which would delineate for each agency the capabilities and responsibilities and clearly define procedures for coordination and direction within the Federal Government for both emergency planning and response.

FEMA should also assure the development and programs to address the recommendation for additional research and public educational needs.

FEMA then entered into a memorandum of understanding with the Nuclear Regulatory Commission. This document was signed by both agencies on January 14, 1980. It confirmed FEMA's role as described by the President and left with NRC the following responsibilities.

Assess the adequacy of the licensee's emergency plans; verify that the licensee's emergency plans are adequately implemented; and review FEMA's determinations of adequacy for State and local plans and make decisions on the overall state of emergency preparedness in connection with the issuance of operating licenses or shutdown of operating reactors.

In January, FEMA and NRC agreed upon the interim document which spells out the expectations for effective emergency plans at the State and local government levels. This document is out for use as an interim document and replaces previous criteria and guidance by the NRC in previous years. It completed the 90-day public comment period on May 13, and is now in the process of getting a combined relook by NRC and FEMA so that we can come up with a final jointly approved document which will serve not only as a planning guide, but the basis for FEMA's review for adequacy and approval for the State and local plans. That document contains a list of 16 planning objectives and a listing of specific items of guidance under each of those.

FEMA's process for review of plans, will be published relatively simultaneously with the proposed final rule by NRC which speaks to emergency planning and preparedness requirements as a condition of certain nuclear powerplant licenses. We will use a rule process to define our policy and procedures for both assisting the States and reviewing the plans. This will include a review by an interagency group at the field level—chaired by a representative of the FEMA regional office in each 1 of the 10 standard Federal regions. It has representatives of NRC, EPA, Department of Energy, the Food and Drug Administration, the Department of Agriculture, and the Department of Transportation.

After the review by this committee from a technical standpoint, and observation of an exercise held by the State for a plant under consideration, the FEMA regional director will then assess and render an opinion of adequacy with regard to each 1 of the 15 planning objectives that are listed in the criteria. The regional director will forward same to national headquarters for the director of plans and preparedness, who will make the final assessment and notify the Governor and NRC of the status of the plans and any deficiencies observed.

Mr. **Kostmayer**. Thank you very much, gentlemen, for your testimony. I have just a couple of questions.

Colonel Henderson, I guess this will be best directed to you.

How long have you held your current position?

Colonel **Henderson**. Four years.

Mr. **Kostmayer**. You were there at TMI?

Colonel **Henderson**. Yes.

Mr. **Kostmayer**. Can you tell me how wide an area we were dealing with at TMI when Governor Thornburg was talking about evacuation and exactly what happened in terms of small children and pregnant women; was it mandatory or voluntary and how big an area are we talking about?

Colonel **Henderson**. At noon on Friday when the Governor issued his precautionary warning to the public and recommendation to the public for an evacuation of pregnant women and pre-school-age children out to a range of 5 miles, this was precautionary and a recommendation. It was not a directive kind of an action.

Earlier that morning we had leared from the NRC for the first time that 2.2 miles prior to that time had been given to us as adequate for our planning and that it now increased to 10 miles.

Mr. **Kostmayer**. That was given to you by whom?

Colonel **Henderson**. By the NRC.

Mr. **Kostmayer**. So they began before the accident with a plan to evacuate a 2.2-mile radius and then after the accident actually occurred, they changed that to what?

Colonel **Henderson**. Ten miles that morning, Friday morning. At 8:30 that night, again our planning requirements changed to a range of 20 miles. Once again, this was from Mr. Denton of the NRC. So we were planning toward a moving target over a period of several days.

Mr. **Kostmayer**. So there really was a distinction between what people were prepared to do and what they actually had to do when a accident actually occurred?

Colonel **Henderson**. That is correct.

Mr. **Kostmayer**. Again, we are talking about 20 miles and not 2.2.

As you know, the NRC pretty much abandoned the original motion of what we called the LPZ or low population zone and replaced that with an emergency evacuation zone, of 10 miles?

Colonel **Henderson**. Emergency planning zone.

Mr. **Kostmayer**. Emergency planning zone. Can you tell me how many people live within 10 miles of the Limerick plant and also 20 miles as well; if you know?

Colonel **Henderson**. I do not have it for 20, but we are planning for protective action out to a range of 5 miles and not to a range of 10.

Mr. **Kostmayer**. To 5 miles and not to 10?

Colonel **Henderson**. Five miles and 10 miles. Within 5 miles, 86,202. Ten miles, 195,906.

Mr. **Kostmayer**. Almost 200,000 within 10 miles?

Colonel **Henderson**. That is correct.

Mr. Kostmayer. Are you prepared at this point to evacuate those people or not?

Colonel Henderson. No, we are not. Our planning has not gone that far. We are presently polishing off the county plans for TMI and Peach Bottom and our next priority is with Duquesne Power & Light down in Beaver County and Berwick and then Limerick. Hopefully by the end of this year we will be well along in this program.

Mr. Kostmayer. In fact, you are not currently required under the law to be prepared to evacuate that amount of people within 10 miles; that is not Federal law?

Colonel Henderson. No, that is not Federal law.

Mr. Kostmayer. That is, of course, the rule which the NRC is currently considering, and the rule is in the tentative stage, which would require that there be a State and local evacuation plan as well as utility evacuation plan before approval of an operating license. Do you have a judgment on whether this is a good idea and necessary or not?

Colonel Henderson. I believe it is necessary, but I am uncertain as to the NRC requirement for an approved State or county and local government plan. I am not too comfortable that I understand what their approval means.

One of the greatest weaknesses right now in any State and local government that is attempting to do any planning is there is no Federal plan and until we have a Federal plan and we understand what the Federal Government intends to do with the Federal resources and how they may be applied in the current 0654. There are requirements in there that we identify people who are authorized to call for Federal agency assistance. When we check out at the present time with the Department of Energy for its assistance, they say, well, we cannot permit anything until after you have the accident.

We are not too comfortable that the NRC approval of our plans is going to get anywhere.

Mr. Kostmayer. You mentioned potassium iodide. Can you tell us what that is, what it is used for and in the case of Three Mile Island, how much of it was available in that area at the time of that accident?

Colonel Henderson. Of course, at the time of the accident there was none available and shortly after the accident, I believe either Saturday night or Sunday morning——

Mr. Kostmayer. The accident occurred on March 29, and which day was that?

Colonel Henderson. Sunday, April 2, to my best recollection, is the first day the liquid potassium iodide started arriving on the scene. Of course, this is a blocking agent for iodide.

Mr. Kostmayer. For radiation poisoning?

Colonel Henderson. For inhalation of radiation; yes.

Mr. Kostmayer. How soon do you have to take it?

Colonel Henderson. The earlier, the better and certainly it is no good after 10 to 12 hours.

Mr. Kostmayer. After 10 to 12 hours it is no good?

Colonel Henderson. Let me say it is not any good over a period of time and I am not medically qualified to answer that. Let me just say over a period of time it loses its effectiveness as a blocking agent because you already absorbed that into your system.

Mr. **Kostmayer**. Had you covered this in your drawing of your own plans, the need for potassium iodide in this area of Pennsylvania?

Colonel **Henderson**. Primarily in the State plan we have addressed it, how we are going to secure it and/or distribute it and how it should be distributed. One of the problems now is that the Federal Government made a recent study by, I believe, Sandia on the cost effectiveness of it and, I believe, it is their recommendation that potassium iodide not be made available to the general public, but only for emergency forces.

Mr. **Kostmayer**. Can you tell me briefly, and I am directing this to some of the others, Mr. McGill and Mr. Ely specifically, what your working relationship is with State and Federal officials in terms of emergency and evacuation planning and the degree to which that has taken place so far?

Mr. **McGill**. Our recent and most practical experience was, of course, the Three Mile Island incident.

Before I address that question, I might say the working relationship between the counties, the State area office and the State itself in all of our experience has been a very cordial and very cooperative type of thing. It has always been a pleasure to work with the people at the State.

At Three Mile Island we were called upon on Sunday morning. My assistant and a registered nurse, who works in the emergency health building, and I proceeded to Lancaster and were met there by the eastern area director of this State emergency management agency, Mr. Ely, and our counterparts from Chester and Philadelphia were also present. The plans for the evacuation were excellently prepared. The eastern area director knew precisely what he was talking about. He had numbers of people who would be assigned to each of the counties. We were assigned between 5,000 and 15,000, depending upon the Governor's decision whether it was going to be 20 miles or 25 miles.

Plans were laid out for transportation, plans have been developed for the movement of hospitalized patients, representatives of the State police were there to discuss traffic and our part was to designate reception areas.

Mr. Ely was designated a reception area close to Valley Forge. All people coming into Bucks County that would be necessarily passing through that area, Mr. Ely would take all the people he could take up to the quantity given him and forward the rest of the people onto Bucks County. Our plans were very similarly developed as Mr. Ely's were.

On Monday morning we met with the Commissioners. I did whatever I had to. At 2 o'clock in the afternoon we had 40 people in the Commissioners' board room which included health people, school people, police, fire, ambulance, anything that would be called upon to respond to this type of emergency, including Red Cross, Salvation Army and just too numerous to mention. The cooperation was excellent.

By Tuesday morning we had a plan written for all the schools. We had a plan for receiving people, how to take care of people——

Mr. **Kostmayer**. I do not want to get into the whole plan. I understand what you are saying and I appreciate that. I want to yield now to the gentleman from Kansas, Mr. Glickman.

Mr. **Glickman**. Thank you, Mr. Chairman.

Mr. McConnell, I am frankly worried that FEMA is incapable of performing this function. My experience with FEMA is, and granted it is not in this part of the country, that in areas of civil defense it is totally without teeth. It is incapable of administering its budget at this early stage of its development, and I am worried about it because it has been given the primary function under Federal law and Presidential direction to move ahead. You have a beautiful statement here, you go into detail in a very well organized fashion as to how you are going to come up with evacuation plans and how you are going to review State evacuation plans, but does it have any teeth? Can the public be assured as of a time certain that you will insure that each State has some sort of an evacuation plan?

Mr. McConnell. We are never satisfied with the amount of resources we have to make available for emergency preparedness. I have been in the business for a long time and I always feel that we should have done more and would like to do more faster. I think we have a good plan in FEMA to get the job done as well as any other Federal agency by soliciting and insisting upon the cooperation of the other agencies.

The President requested an $8.9 million supplemental for 1980 to assist FEMA in taking on this program which was assigned in the middle of the fiscal year. This has not been acted upon by the Congress as yet. The House Appropriations subcommittee marked it at $1.9 million, for example.

We know that the States and local governments are having difficulty accomplishing what they would like to accomplish because of lack of personnel and dollars to carry out a completely effective program.

Mr. Glickman. Let me stop you for a minute. What is the total fiscal 1981 budget of FEMA; do you know, just generally?

Mr. McConnell. I am sorry, I cannot give you a total figure.

Mr. Glickman. Is it around $125 million?

Mr. McConnell. No; that is low because the civil defense program, that part of the program that is in support of the National Civil Defense Act, is around $120 million.

Mr. Glickman. How much of the total budget is in the functions that you described in your testimony?

Mr. McConnell. Well, we are having to——

Mr. Glickman. The fiscal 1981 budget.

Mr. McConnell. Oh, fiscal 1981?

Mr. Glickman. That is correct, starting October 1.

Mr. McConnell. We have had to submit a supplemental request because our 1981 budget had been submitted before we got this charter in mid-December. The supplemental request we asked for will be, I believe, $4.6 million.

Mr. Glickman. How many total dollars will you be spending in fiscal 1981 on the question of evacuation plans for nuclear powerplants?

Mr. McConnell. That is difficult to say because most of our assistance will come in the form of manpower assistance to the State. For example, we have diverted the planners who are in the 40 States with active reactors under construction. There are 130 planners in those States.

Mr. Glickman. You diverted people in the State. What roles were they performing?

Mr. McConnell. They were preparing plans against nuclear attack. Essentially the crisis relocation planning from potential target areas from nuclear attack.

Mr. Glickman. So you diverted people from what you call classical civil defense functions. Does that include tornado preparations, hurricane warnings, and so forth?

Mr. McConnell. No, sir. The civil defense program in Federal terms is preparation against attack on the United States. The byproducts of all those systems developed, such as the warning systems and the emergency management planning and training that is made available to States, certainly enhances their ability to deal with the different kinds of emergencies.

Mr. Glickman. But you cannot tell me how many dollars for fiscal 1981 you have allocated to these functions; is that figure obtainable?

Mr. McConnell. It would have to be a judgment process giving portions of staff time, for example.

Mr. Glickman. Can you tell me how many staff people will be available in fiscal 1981 to deal with these functions?

Mr. McConnell. You are speaking of the functions for preparedness around nuclear powerplants?

Mr. Glickman. Correct.

Mr. McConnell. Well, as long as the initial preparedness is being enhanced, about 50 to 60 staff people at the regional level, Federal regional representatives who work directly in the State, with the State, plus 130 people who are paid with Federal funds. They are employed by the State under contract.

Mr. Glickman. Those will be local civil defense people who might be redesignated?

Mr. McConnell. Those contract personnel employed by the State with Federal funds——

Mr. Glickman. How many Washington-based people are working on this issue?

Mr. McConnell. Again, it takes a portion of our respective staff time. We have 12 people in a new division that has been formed and staffed, as Mr. Denton said, originally by people detailed from NRC.

Mr. Glickman. I am having some problems with this. You are the agency that is supposedly planning for the protection of people. You have given me what the human part of your plans are going to be. Under your testimony, you are supposed to complete by June 1980 a review of State emergency planning from States with operating reactors. Will that plan be done?

Mr. McConnell. Yes, indeed.

Mr. Glickman. By June 1980?

Mr. McConnell. Yes, sir. That does not mean that they will be complete, but we will have conducted a thorough review and assessed their state of adequacy.

Mr. Glickman. OK; then what will you do?

Mr. McConnell. We point out the the deficiencies and assist the State in improving them so the plans eventually will be approved.

Mr. Kostmayer. Thank you very much. The gentleman from Massachusetts is recognized.

Mr. **Markey.** Thank you, Mr. Chairman.

I would like to thank you, too, for having this hearing because all too often in Washington you get very isolated from the concerns of American citizens and they do not have the opportunity of having this kind of forum made available to debate this kind of situation as much as people in Washington. I guess it does not make any difference whether you are pronuclear or antinuclear because I hope we could all agree that the people in this room are prosafety.

I think by having people from across our district and across the State of Pennsylvania to have this opportunity, I think it makes all the rest of us, no matter where we stand on the broader question, a lot more aware of this issue, and I thank you for making this opportunity available to us.

Can I ask the people here today, that FEMA is a relatively new organization. Am I wrong in my recollection that when you were given the responsibility of preparing for emergencies at nuclear powerplants, that many of the personnel who you now use are former Nuclear Regulatory Commission personnel who were sent over to you and the people who formerly had the responsibility in the NRC were now sent over to you to help you; is that pretty much an accurate statement?

Mr. **McConnell.** Twelve such people were detailed to FEMA and remain there at the present time.

Mr. **Markey.** So people who used to have responsibility at the NRC are now over with you at FEMA doing the job?

Mr. **McConnell.** Technical parts of the job.

Mr. **Markey.** That is disturbing to me because I would have hoped you could have had zero [rest of statement drowned out by audience].

Let me ask you this. Assuming that FEMA is able to establish an independent, a Federal institutional integrity of its own, who do you think should have the final responsibility in determining whether or not a plant ought to open if in the determination of FEMA an adequate emergency plan is not in place; do you think it should be FEMA or the NRC?

Mr. **McConnell.** Insofar as the State and local emergency plans are concerned, we believe that FEMA should be able to make the final determination.

Mr. **Markey.** FEMA should be able to veto a decision made by the NRC whether a plant should open which would be contradictory to your assessment that there is no emergency preparedness plan in place?

Mr. **McConnell.** Would you state that question again, please? It sounded to me like you made a double reverse on it.

Mr. **Markey.** If there is no emergency plan in place which FEMA finds to be satisfactory, should the NRC be able to overrule your judgment that there is no plan in place and be able to start up that plant regardless of your recommendation that it not?

Mr. **McConnell.** I do not believe so.

Mr. **Markey.** The NRC in its proposed rulemaking has a recommendation that the proposed regulation would allow—that is, the proposed NRC regulation—that in the absence of an approved State and local emergency plan—that is, no plan is in place—to issue no operating licenses. The Commission could still allow to start up a nuclear powerplant if: (1) Deficiencies in the plans are not significant; (2) alternative compensating actions will be taken promptly; or (3) there are other compelling reasons for the license's issuance. This seems to be a broad category of reasons. These seem to be pretty broad loopholes that the NRC could license, if they chose to, a plant in the absence of an existing emergency plan. Does that disturb you at all or do you think that is overly broad? Do you think FEMA should have the ultimate responsibility of this?

Mr. McConnell. I believe that the NRC feels that FEMA should be given total responsibility for offsite emergency preparedness, but they cannot divest themselves of their legislated responsibility. Therefore, they have to assume it.

Mr. Markey. Do you think that the NRC or FEMA should have the final determination?

Mr. McConnell. For the determination and approval in the offsite planning, FEMA should have that.

Mr. Markey. That is somewhat in contradiction to the NRC's thinking, direct contradiction to the NRC.

In a worst-case scenario, a meltdown at a nuclear powerplant, are any of these plans going to afford any measures of protection to the public?

Mr. McConnell. Plans will not protect anyone. It is the preparedness that takes place as a result of the plans. That is the reason we must conduct exercises and evaluate the capabilities of State and local governments to operate within the scope of those plans.

Mr. Markey. What I am saying is that at the time of nuclear meltdown—and we were fortunate to avoid that at Three Mile Island—if we did have that worst-case scenario, the case where a nuclear powerplant has as much nuclear radiation potential, which most of these plants have now, many times greater than a bomb at Hiroshima, what kinds of real protection can we offer to people if that occurs?

Mr. McConnell. Obviously there are two ways to protect oneself from radiation. That is, to be in a shelter which offers both the mass and lack of infiltration of air or evacuate. The question is, will sufficient time be available in a given set of circumstances to evacuate people from the area.

Mr. Markey. What I am asking, have you made that evaluation of the worst-case scenario? How much time will they have from a Three Mile Island; how much time then do we have to protect the people from that kind of meltdown situation?

Mr. McConnell. It depends on the time of notice about the condition inside the plant and the actual release of radiation outside.

Obviously the 15-minute warning capability will create a better situation than we had before, as it will allow people to take shelter or to gather in a place where they might protect themselves, rather than to evacuate under a panic situation with no notice whatsoever. However, the chances are much greater that time would allow a period for evacuation after first notice from the plant. It is certainly better to have plans to do both than not to have them.

Mr. Kostmayer. Thank you very much. The gentleman from Nebraska is recognized.

Mr. CAVANAUGH. Thank you, Mr. Chairman.

Colonel Henderson, you stated that one of the greatest difficulties with developing a plan in coordination with the Federal Government is because there is no Federal plan. The Federal Government, FEMA, and NRC did in January promulgate rules and regulations whose comment period ended on May 13. Do you not consider that an adequate and comprehensive Federal emergency plan and did you comment on the plan during the comment period?

Colonel HENDERSON. I do not consider these interim draft guidelines a plan. What it is is a set of standards issued by the Federal Government. It is not a Federal contingency plan.

Mr. CAVANAUGH. Did you comment on the proposed guidelines?

Colonel HENDERSON. Frequently.

Mr. CAVANAUGH. You made formal comments?

Colonel HENDERSON. Yes.

Mr. CAVANAUGH. And what has been the result of those comments?

Colonel HENDERSON. Well, the NRC and FEMA have not made their determination of what will be the final product as a result of the public hearing period and the comments that were received by them.

Mr. CAVANAUGH. Mr. McConnell, when will FEMA promulgate the final plans? Well, let me put it this way. Will the result of the criteria for preparation and evaluation result in a comprehensive Federal plan?

Mr. MCCONNELL. No, sir. That is criteria and guidance for the State and local plans. We are, however, developing a national contingency plan which will involve all of the Federal agencies that would be involved in a response. We have a set of procedures which have been used by the Federal Disaster Assistance Administration for many years and improved upon annually that will be used in case of a Presidential declaration of disaster, where there will be a Federal coordinating officer from FEMA assigned to the scene to coordinate activities.

It is around that authority that we will be building a national contingency plan and will specify more precisely how the Department of Energy Inter-Agency Response Plan for monitoring will fit in.

Mr. CAVANAUGH. When will that contingency plan be completed?

Mr. MCCONNELL. We will have a complete first draft by the 1st of September this year. In the meantime, we have interim plans in a separate Memorandum of Understanding with the NRC for the way that the two agencies would work together.

Mr. CAVANAUGH. Mr. McConnell, you testified that FEMA was directed to undertake and complete by June 30 a report on the status of State emergency plans. Will you successfully complete that review?

Mr. MCCONNELL. Yes, sir. Our regional offices are reviewing the plans of every State at the present time regardless of their condition in order to point out deficiencies in line with the new criteria. As a result of these reviews, we will render a status report in June to the President.

It appears at the moment that at least 17 of the States will have completed their plans and preparedness to the point where FEMA will be in the process of making a final review. I had hoped to have more, but as of now, it appears that 17 out of 26 States with operating reactors will be completed.

Mr. **Cavanaugh.** Do you expect Pennsylvania to be among those 17?

Mr. **McConnell.** Yes, sir. I just reviewed, with the representative of our regional office, who is in the audience, the status of their review of the current submission that Colonel Henderson mentioned. There are only three items that are not covered in the plan and they seem to be ones that could be added very easily. There were originally 36 points out of 100 that were reviewed, and recommendations for slight corrections and improvements were made.

In discussing with the regional representative, Pennsylvania should be able to provide those improvements within 2 to 3 weeks.

Mr. **Cavanaugh.** Thank you, Mr. Chairman.

Mr. **Kostmayer.** Thank you very much. Gentlemen, I want to thank you for your testimony. I think we found it most worthwhile and beneficial.

Our next to last panel is Mr. V. S. Boyer, senior vice president with the Philadelphia Electric Co., and Mr. R. H. Logue, engineer in charge of nuclear environmental section of the Philadelphia Electric Co.

Gentlemen, you may read your testimony if you like or summarize in the interest of time.

[The prepared statement of V. S. Boyer may be found in the appendix.]

PANEL FROM THE PHILADELPHIA ELECTRIC CO., CONSISTING OF VINCENT S. BOYER, SENIOR VICE PRESIDENT, NUCLEAR POWER AND R. H. LOGUE

Mr. **Boyer.** I am pleased to appear on behalf of the company in response to Chairman Udall's letter of April 16 inviting our appearance at this hearing to testify concerning certain aspects of our Limerick station.

Before addressing the subjects covered in this letter, I would like to review briefly the company's background and experience in the use of nuclear energy for the generation of electricity.

In 1958, in response to invitations from the Federal Government to industry to participate in the development of nuclear energy for the generation of electricity, Philadelphia Electric Co., supported by 52 other electric utilities, submitted a proposal for the construction and operation of the world's first high-temperature, helium-cooled reactor. Following approval of the proposal by the Joint Committee on Atomic Energy and the Atomic Energy Commission, the plant, now known as Peach Bottom No. 1 was constructed and successfully operated for a period of 7 years. It was retired in 1975, having successfully fulfilled its role as a prototype reactor.

In 1974, following the appropriate regulatory approvals, we placed in operation units 2 and 3 at Peach Bottom. These units, owned jointly with Public Service Electric and Gas Co., Delmarva Power & Light Co., and Atlantic City Electric Co., use boiling water reactors, and have been providing reliable, low-cost energy for our customers. Together with the three other utilities, we are also joint owners of Salem units 1 and 2. These units, which employ pressurized water reactors, are located in Salem County, N.J., and are operated by Public Service Electric and Gas.

In 1970, 10 years ago, Philadelphia Electric applied to the Atomic Energy Commission for authorization to construct the Limerick generating station, employing two 1,050 megawatts boiling water reactor units. The basic plant design for Limerick is similar to Peach Bottom units with numerous modifications in recognition of the higher population density of this site. Bechtel Power Corp., which designed and constructed Peach Bottom units 2 and 3, has the same role for the Limerick plant. Construction permits were issued by the AEC in June 1974 and the units have been under construction since that date. We anticipate filing our application with the Nuclear Regulatory Commission for operating licenses around the end of 1980. The plant is presently 52 percent complete overall with unit No. 1 over 60 percent complete and unit No. 2 about 35 percent complete.

As in the case of the Peach Bottom units, we expect that the Limerick units will bring our customers cheaper electricity than would be the case without Limerick. The operation of Peach Bottom units 2 and 3 has significantly reduced our customers' electric bills. In 1979 alone, the operation of Peach Bottom reduced customers' electric bills by $115 million. An average residential customer using 500 kilowatt-hours per month saved about $2 a month or $24 over a year. Since Peach Bottom went into operation in 1974, Philadelphia Electric Co.'s customers have saved about $225 million in their electric bills. Peach Bottom's performance has been safe, reliable, and economical. Peach Bottom unit 2 set an all-time free world record for annual electrical energy output by a single generating unit—either nuclear or fossil fueled. This 1,055 megawatt unit produced over 8.5 billion kilowatt-hours during 1979, and it operated with a capacity factor of 93.1 percent for the year.

Limerick on line will save Philadelphia Electric Co.'s 1.3 million customers about $430 million average per year based on the time period of 1985 through 1990. Over the first few years of operation, a 500-kilowatt-hour-per-month customer will save about $6.30 per month on his or her electric bill. This $6.30 per month or $75 a year is the minimum expected saving; actual savings will most likely be greater, especially after the first few years of operation, because we must remember that coal unit fuel plants are escalating. The alternatives to Limerick would mean higher electric bills for our customers.

In recent years, we have periodically studied the comparative costs of nuclear, oil and coal-fired generation. These studies consistently point to nuclear as the most economical for our customers.

We recently compared the cost of a two-unit nuclear plant and a three-unit coal plant for completion in 1990. Electricity from the nuclear plant was estimated to cost 6.9 cents per kilowatt-hour compared to 8.6 cents for the coal plant. The annual reduction in costs amounts to about $250 million.

Likewise, in February 1979, the Nuclear Regulatory Commission published a report: "Total Generating Costs: Coal and Nuclear Plants." As a result of their analysis, the NRC estimates differential savings for a nuclear plant to be in the range of 2 to 3 cents per kilowatt-hour.

All competent estimators arrive at the same conclusion: In the northeastern part of the United States, nuclear generating units are cheaper than coal-fired generating units.

The substitution of coal, solar power and wind power for nuclear, if practical, would, of course, save an equivalent amount of oil, but it would be at the ratepayers' expense. If Limerick station were replaced with an equivalent coal station, the earliest such a station could be built is about 1990. In 1990, we estimate electricity from Limerick will cost about 7 cents per kilowatt-hour. A coal plant would run about 8.5 cents per kilowatt-hour.

A discussion of converting Limerick to a coal-fired station, as well as other alternatives, will be presented in the environmental report which will be submitted with the Limerick operating license application. Solar- and wind-powered stations are so impractical that it is hardly reasonable to mention them for comparison. Electricity from an equivalent wind-powered station would cost about 30 cents a kilowatt-hour, and would require about 7,800 square miles to produce the same amount of energy or three times the service area of the Philadelphia Electric Co. An equivalent solar station would produce electricity at about 40 cents a kilowatt-hour and cover a land area of 20 to 50 square miles.

Nuclear power stations not only cut the cost of electricity for our ratepayers, they also significantly reduce the U.S. dependence on oil imported from the Mideast. Limerick on line will save the country 22 million barrels of oil each year, and this is more than the daily consumption rate of our entire country.

Our regional power forecast shows a heavy dependence on foreign oil supplies for adequate reserve capacity. Philadelphia Electric Co. is a member of the regional power pool called the PJM Interconnection. Our forecast of peak demand and installed capacity are available and included in my paper.

The PJM Interconnection appears to have adequate reserve generating capacity in the years 1985 through 1987. However, of the 54,000 megawatts of generating capacity expected in 1987, it includes over 9,000 megawatts of generating capacity to be installed between now and 1987. Some of this generating capacity will probably experience a slippage in service dates and may not be available in 1987.

One-hundred-percent reserve generating capacity is oil fired. Thus, the reserve capacity, the PJM customers are dependent on a continuous stream of tankers from the OPEC nations, which supply could be interrupted at any time.

Philadelphia Electric Co., and the entire electric utility industry are very much aware that the public has a legitimate interest in the safety aspects of nuclear generation as well as its economic aspects.

During the Limerick construction permit proceedings before the Atomic Energy Commission, the Advisory Committee on Reactor Safeguards, established by Congress to independently review the safety aspects of nuclear reactors, concluded that the Limerick station could be constructed and operated without undue risk to the health and safety of the public.

The major determinations of the AEC's Division of Reactor Licensing in the Limerick construction permit proceedings can be briefly summarized as follows:

The distances established for the exclusion zone for the low population zone and the nearest population center meet the regulatory requirements.

Site meteorology, hydrology, geology and seismology are all acceptable.

The design of the reactor vessels, reactor internals and fuel assemblies are acceptable.

The piping systems associated with the reactor are designed in full compliance with AEC requirements and are provided with appropriate restraints and supports to prevent damage to containment and equipment in the unlikely event of a pipe break or rupture.

The leakage control and leakage detection systems are acceptable.

The design of the primary containment system employing the over/under configuration is acceptable.

The design of the reactor building, that is the secondary containment building, being of reinforced concrete construction throughout and which is provided with air recirculation systems together with an improved standby gas treatment system will limit the release of radioactive effluents is acceptable.

The systems provided to inert the primary containment atmosphere and to control hydrogen generation following an accident are acceptable.

The design of the emergency core cooling systems includes improvements in the high pressure and low pressure coolant injection systems which enhance the cooling of the fuel cladding during postulated accidents and is acceptable.

The criteria established for and design of instrumentation, control and electrical power systems are acceptable.

The design of the radioactive waste treatment and handling systems includes improvements and features beyond those of other contemporary plants and is acceptable.

Analysis of design basis accidents, such as loss-of-coolant, fuel handling, control rod drop and main steam line break, yield calculated offsite exposed dosages which are well within the regulatory limits.

The quality assurance program complies with the regulatory requirements and is acceptable.

The safety evaluation found that there is reasonable assurance that the proposed Limerick facility can be constructed and operated at its proposed location without undue risk to the health and safety of the public.

Since 1970 and prior to the Three Mile Island accident, the company added a number of new and important features and improved features to the original design of the Limerick plant. These features include the following:

Increased design margin on essential piping systems.

Improved reactor shield design and installation of vibration monitoring systems.

Increased seismic design criteria. Leaktight reactor building of reinforced concrete construction incorporating air recirculation and high efficiency filtration systems.

Chilled charcoal waste gas treatment system to further reduce radioactive releases.

Provisions for inerting and hydrogen control of primary containment atmosphere.

Systems for preventing leakage from piping systems.

Additional emergency power supply systems.

Additional quality control and inspection systems.

Shortly after the accident at Three Mile Island the Nuclear Regulatory Commission, industry groups such as the Electric Power Research Institute, individual utilities and the President's Commission began to review details of the accident and assess its causes so that similar accidents would be prevented. Although our Peach Bottom and Limerick designs have boiling water reactors which are different in design from the pressurized water reactors at Three Mile Island, the results of these reviews provided valuable insight for us on reactor safety.

At our annual meeting of shareholders on April 4, 1979, our president, J. L. Everett of the Philadelphia Electric Co., stated the company

> Will analyze the accident thoroughly and review our own plant design and operation to make certain we apply what we've learned to improve the safety of our facility wherever possible.

A week later, I established the Three Mile Island Event Committee to review the sequence of events of the accident and prepare recommendations to be used in evaluating our nuclear facilities. This committee comprised five engineers from Philadelphia Electric Co. as well as representatives from the other owners. The committee's report was issued on August 22, 1979, and it contained 22 recommendations for implementations, some on a short range and some on a long range term.

The NRC initially reviewed the five operating Babcock & Wilcox plants of similar design to that of Three Mile Island. It then focused on the operating reactors designed by Westinghouse, Combustion Engineering and General Electric Co., to determine if measures to reduce the potential for accidents should be implemented at plants designed by those companies.

The NRC has sent to all utilities with nuclear powerplants under construction requirements necessary to provide substantial additional protection for the public health and safety and which must be implemented prior to receipt of an operating license. They cover principally training and operating procedures, plant design and emergency planning. Limerick generating station will meet these requirements.

For example, in the area of plant design, the safety valves on each nuclear steam supply system will be provided with acoustic emission monitors to better detect their opening. This type of monitor to detect the opening of safety relief valves at our Peach Bottom units had been installed prior to Three Mile Island as an innovative research project to develop better ways to detect valve leaks.

We are also designing the primary containment isolation valve to prevent inadvertent reopening should an accident occur. We are also reexamining the adequacy of shielding to protect operators and equipment from high radiation coming from systems containing primary coolant or primary containment gases. Additionally, radiation monitors, as Harold Denton noted, which have the capability of measuring very high levels of radiation will be added to the plant.

In April 1979, the utility industry, through its Electric Power Research Institute, established the Nuclear Safety Analysis Center to investigate the Three Mile Island accident.

With the budget of 1980 for $7.5 million NSAC, as it is called, has established the following work programs to respond to the needs of the utility industry.

The significant event evaluation program has been established as a mechanism for systematic searching nuclear plant operating experience for early warning signs of potentially serious events.

In-depth studies of significant events will be performed, such as the already completed review of the incident at the Crystal River plant in February 1980.

Additionally, generic safety studies, such as information display in control rooms and application of probabilistic risk assessment, will be performed.

And four, a library of technical and operating information has been established, and rapid communication of information pertaining to safety is transmitted to utilities with a small computer terminal. This communication tool is known as Notepad employed by the Philadelphia Electric Co.

In October 1979, the Institute of Nuclear Power Operations, known as INPO, was incorporated for the purpose of providing industrywide standards of excellence in nuclear power operations and of conducting evaluations of utilities to help them meet these standards. This will include determining the educational and training requirements for operating personnel and for certifying instructors. INPO will also develop training programs for plant supervisors and identify the best practices for nuclear plant operations. Pilot evaluations of nuclear plant operations have already been performed and the first official evaluation is scheduled for this month.

Philadelphia Electric Co. is a member of INPO along with 56 other utilities. INPO is working with a budget of $11 million for 1980 and is developing a staff which should number around 200 by the end of the year. A board of directors has been formed consisting of senior utility executives and an advisory board consisting of seven persons drawn from academia, industry, the aerospace program and technical societies. The activities of INPO will be closely coordinated with NSAC. The objectives of NSAC and INPO have been established to increase the assurance that nuclear powerplant operations are performed safely. These objectives address some of the major recommendations made by the President's commission. Philadelphia Electric Co. will benefit from both of these organizations.

The NRC published last October the final report of the lessons-learned task force. In contrast to the short-term recommendations of the task force, which were a more narrow and specific and of an urgent nature, this final report addresses safety questions of a more fundamental policy nature.

The long-term lessons learned can be characterized as recommendations oriented toward improving training, operator qualifications, and licensing. These long-term lessons-learned recommendations have been incorporated into the NRC's Three Mile Island action plan.

This plan has been developed to provide a comprehensive and integrated plan for all actions judged necessary by the NRC to correct or improve the regulation and operation of nuclear powerplants that are based on studies and investigations of the Three Mile Island accident. Many of the recommendations have already been implemented in operating plants. Most of the other recommendations are scheduled to be completed over the next year or two.

Philadelphia Electric Co. has long been a leader in nuclear training. As early as 1958 certain key people now in managerial positions were training in nuclear power in preparation for the operation of our first nuclear project, Peach Bottom No. 1. That early plant was equipped with a small simulator to assist in operator training.

For Limerick, it was recognized that training must be preceded by a thorough selection program. About 2½ years ago such a program was devised and implemented. Out of approximately 200 people who first expressed interest in the operations of Limerick, a group of 55 highly qualified individuals were selected. This group consists of some with fossil experience, some with nuclear experience and some with both fossil and nuclear experience. Our goal is to integrate all of this valuable experience at Limerick.

The training program includes academic training in heat transfer, fluid flow, and thermodynamics; research reactor training at Pennsylvania State University reactor facility; observation training at Peach Bottom; boiling water reactor technology; Limerick design features; plant familiarization program and simulator certification, which is expected to be a 12-week certification course on the Limerick simulator.

To facilitate this training, as well as augment the training of Peach Bottom operators, a decision was made in 1978 to build a training center near the Limerick site and equip this center with a simulator. It is designed specifically like a plant and will simulate the Limerick units in appearance and response and characteristics. The simulator meets or exceeds all of the requirements of the American Nuclear Society's standards for nuclear powerplant simulators. The training center will be operated by General Physics Corp. The building was recently completed and the simulator is presently undergoing testing at the manufacturer's plant. It is expected to be installed in the training center in September of this year and be ready for operator training in January 1981.

Since the simulator was ordered prior to the Three Mile Island accident, a review was conducted of the design to be sure that the machine and the instructions complied with the post-TMI requirements.

There will be training in the use of installed plant systems to control or mitigate an accident in which the core is severely damaged. There will also be increased emphasis on handling changes in plant or reactor conditions. The simulator is capable of demonstrating variable loss of coolant accidents both inside and outside of containment. Various sizes of loss of coolant accidents, including small breaks, will be part of the program. The training center instructors will be qualified to take the NRC senior operator examination prior to instructing operators.

At Limerick, we plan to operate and train as a team. There will be six teams rather than the usual four or five and the schedule will be so arranged that there will be 4 days' training every 6 weeks. By this staffing arrangement, we will meet or exceed the recommendations of the Kemeny Commission report in that training will be continuously integrated with operating experience.

From the earliest stage of the design of the control room panels at Limerick, individuals with an operating background were involved. As a result of this involvement, all the panels at Limerick are pictorialized, making it much easier for the operator to follow the course of events. Human engineering has also been a factor in control room design. Most of the devices which must be frequently manipulated by the operator are on the bench boards while the more seldom used devices or recording devices are on the vertical boards. The equipment related to one particular system is adjacent to other equipment on the same system. Systems are separated by a well-defined black line to help avoid operator confusion. Certain information is transmitted to the operator using color videotubes. These tubes were mocked up and the displays modified to be sure there was not excessive information density on any one page and to insure that the information was legible and understandable. There is an ongoing task force within the company studying the human engineering of the panels.

Peach Botton procedures will be used as a pilot for writing Limerick procedures so that rather than starting with nothing, Limerick will be able to build on the Peach Bottom experiences. By so doing, the Limerick procedures will reflect the Three Mile Island lessons learned, as well as other operational experience that has been gained at Peach Bottom.

Another key factor in the translation of operating experience from Peach Bottom to Limerick is in the area of the plant technical staff. Several individuals on the staff have many years of Peach Bottom experience and other individuals have U.S. Navy nuclear submarine experience. The remaining individuals have years of fossil plant operating experience. This mix of training and experience of the key management group at Limerick will assure that sound operating practices are established and followed.

In the preliminary safety analysis report filed with the construction permit application, the basic components of an emergency plan to be developed for Limerick were discussed. These components were based upon our Peach Bottom plan, as it existed then, and this submittal was found by the AEC to fully meet its requirements. Since that submittal in June 1971, we have had, through our Peach Bottom operations, the benefit of years of operating experience, the experience of emergency plan drills, and of periodic emergency planning reviews.

Pursuant to NRC requirements, an emergency plan for Limerick Generating Station is being prepared for submission as part of the final safety analysis report when Philadelphia Electric Co. applies for the Limerick operating license.

The plan will reflect the changing requirements for such plans since Three Mile Island as expressed in the NRC regulations; Nureg-0578 on short-term lessons learned; Nureg-0610 on classification of emergency conditions; emergency planning acceptance criteria; Nureg-0654, criteria for preparation and evaluation of radiological emergency response plans and preparedness in support of nuclear powerplants; in the NRC's letter on April 25, 1980 regarding emergency centers.

Many of these changes in criteria require in-depth engineering studies, and a review of the state-of-the-art in certain areas such as instrumentation and coordination with State and local planners to insure that the proper equipment and methods are utilized. In keeping with our philosophy of actively seeking ways of improving our operations and providing safe, reliable service, Philadelphia Electric Co. has been and will continue evaluating and responding to these changes.

The Limerick emergency plan will provide for facilities, equipment, organization, and methods to insure the capability for rapid response to a wide spectrum of abnormal conditions ranging from minor events, which may be anticipated at any large industrial facility, to postulated accidents with only a remote probability of occurrence. It will include the means for continuing assessment of plant conditions, communication with appropriate offsite authorities, and for activating the technical and physical resources of many groups in the nuclear industry. The plan will provide for reliable communication methods and transmittal of information to assist State and county officials in decisionmaking. Major features of the plan will include:

1. The definition of four distinct emergency classes of accidents as provided in Nureg.
2. Establishment of well-defined criteria for declaring the various classes and for implementing immediate response actions.
3. Assignment of shift operations personnel to emergency teams to provide immediate response.
4. Assignment of Limerick technical staff personnel to emergency teams to insure rapid response to assist shift operations personnel.
5. A Technical Support Center in which senior members of the plant technical staff can evaluate conditions and assist shift personnel in making plant operational decisions.
6. Establishment of a Philadelphia Electric Co. headquarters support organization to provide assistance in the areas of technical evaluation and logistics support. With some adjustments, this organization will be very similar to that employed for many years by the company in the restoration of electrical service under storm conditions.
7. Establishment of a long-term recovery organization capable of in-depth technical evaluations, coordination of resources available throughout the nuclear industry, and development of recovery plans.
8. A flexible communications capability to activate the various emergency teams and organizations and to insure uninterrupted flow of information.
9. Coordination of responsibilities and resources of onsite and offsite groups, including Federal, State, and local agencies.
10. Preplanned procedures to define emergency responses.
11. Provisions for medical assistance and transportation.
12. Training of emergency teams and other physicians in the emergency organization.
13. Performance of drills to test the capabilities of the various teams and organizations.

In keeping with the company's full disclosure policy of providing the news media and the public with information on our nuclear powerplant operations, revision of the specific emergency public information plan was started following an intensive analysis of communications problems at Three Mile Island. This plan will provide the facilities and methods for the timely release of accurate information in conjunction with other information agencies which may be involved.

With these features, Philadelphia Electric is confident that when the plant is completed, it will meet the NRC requirements and will be fully compatible with State and local plans.

To date, we have had meetings with the Pennsylvania Emergency Management Agency, the bureau of radiation protection of the Pennsylvania Department of Environmental Resources and, as directed by PEMA with emergency planning, officials of Montgomery, Chester, and Berks Counties.

Our goal is to have an emergency plan which is responsive to the most recent NRC criteria, which is fully coordinated with the Pennsylvania Emergency Management Agency and County Plans and which utilizes the experience gained at Peach Bottom.

Further, while we believe that the conservative design of the plant, its extensive safety features, and the operation of the plant by well-trained personnel will preclude the need to ever fully utilize the plan, we will be ready with trained personnel to fully implement the plan for the protection of our employees and for the public.

Mr. KOSTMAYER. Mr. Boyer, I would like to ask you several questions. On page 19 of your testimony, you mentioned provisions for medical assistance and transportation. Can you tell me if that includes provisions for the distribution of potassium iodide?

Mr. BOYER. The question on potassium iodide has not yet been firmly decided by appropriate health authorities. If there is a requirement by the NRC or by the appropriate regulatory authority for the utility to have available supplies of potassium iodide, we will comply. I would expect that after the health aspects of potassium iodide have been fully explored, there will be a decision made as to whether it is appropriate to use as a blocking agent and which agency, State or Federal, should be responsible for maintaining supplies.

Mr. KOSTMAYER. You discussed also classes of accidents. I think you mentioned a class 4 accident?

Mr. BOYER. Yes.

Mr. KOSTMAYER. Is a class 9 accident included in there?

Mr. BOYER. No, a class 9 accident is covered in those various classes of accidents, from a general alert to an emergency.

Mr. KOSTMAYER. So I gather in a class 4, that would cover a class 9?

Mr. BOYER. Yes.

Mr. KOSTMAYER. Is your company a member of the Edison Electric Institute?

Mr. BOYER. It is.

Mr. KOSTMAYER. Can you tell us what that organization is?

Mr. BOYER. The Edison Electric Institute is an institute of the utility to represent their interests in affairs of mutual interest to all utilities, to hold meetings and to have committees which look into various programs of mutual interest. I happen to be in charge of an Edison Electric Institute committee on occupational radiation exposure. I am a member of other committees which look at various nuclear subjects which get together to discuss problems. The prime interest committee has certainly been a committee of the Edison Electric Institute which for years has been extremely valuable for the dissemination of information among utility personnel on mutual problems.

Mr. Kostmayer. Would it be fair to characterize the Edison Electric Institute as a trade group or generally promotional in nature of your industry?

Mr. Boyer. Yes, I think that would be appropriate.

Mr. Kostmayer. As you heard this morning, Mr. Denton testified that some things are changing at the Nuclear Regulatory Commission. One thing that is changing is their notion of the importance of an evacuation plan. Apparently, this was not given the same kind of consideration in 1974 when your company received the construction permit as it is given today.

I wonder if you can tell me whether you share this view that the policy should be changed and that the importance of an evacuation plan should be put on the same par as design issues? As you know, there has been dissension, as Mr. Denton said, now that the Nuclear Regulatory Commission will henceforth be regarding an evacuation plan as equally important as design features of the plant itself.

On February 19 of this year, the Edison Electric Institute, I think you will remember, specifically rejected this view and reiterated the industry's position that design features will take care of safety questions. I wonder if you can tell me about that?

Mr. Boyer. If you had not said that, that was going to be my answer. Absolutely not, evacuation plans do not take the place of a properly designed and operated facility.

Mr. Kostmayer. I was not suggesting that they should take the place. I wonder if you think that they should be equivalent to it?

Mr. Boyer. No; they can never be equivalent to——

Mr. Kostmayer. So you do not share Mr. Denton's view that they are equally important?

Mr. Boyer. I do not know that he exactly said equally as important. He might have said that there is increase in importance to take an appropriate role or equal role. I think he did not say that they were equal importance. Certainly in my view—at any rate, Mr. Denton can speak for himself, but the design of the facility and operation of the facility is of much greater importance.

Our plant is designed first to minimize or prevent the probability of accidents. We have to say minimize the possibility of accidents, but should they occur, we have many lines of defense. We have added additional features in the design of Limerick to maintain any releases from an accident onsite, and that is the protection that is needed.

Evacuation plans then are just the window dressing in the final backup plan.

Mr. Kostmayer. Has the view of your industry or your company in particular changed on this issue at all as the view of the Nuclear Regulatory Commission has: even though your view and their view may be somewhat different, has there been any change in your view since 1974 as apparently there has in the nuclear regulatory agency?

Mr. Boyer. Our opinion has not changed; it is the natural outgrowth of the Three Mile Island event. There is going to be closer examination given to emergency plans. I am not saying that emergency plans should not exist. I am saying, however, that even in areas where emergency, detailed emergency plans have not existed, there have been evacuations performed of numbers of people similar to that of what we are talking about in the Limerick area. In fact, even greater without any great problems.

We have with us today a gentleman from Nuclear Utility Services, who is resident of—who was a resident of Mississauga, Canada, where they had an evacuation of 225,000 people last year when they had a rail accident which punctured a chlorine car. It was necessary to evacuate 225,000 people. Theye were in a fairly densely populated area and certainly the density population is greater than that around Limerick. This was done without any great commotion; hospitals were evacuated in half the time it had been estimated and so these things with planning, even minimal planning, can be done when they are necessary.

With all the planning that is being accomplished on the programs underway today, it ought to go like greased butter.

Mr. Kostmayer. Your own plan, your own evacuation plan drawn up by Philadelphia Electric and which is required to be submitted to the NRC before you can get your operating license, can you tell me what radius around the plant that evacuation plan has?

Mr. Boyer. Well, the present contemplated or recommended requirement by the Nuclear Regulatory Commission is 10 miles. That is subject, I believe, to some review so it could be modified.

Mr. Kostmayer. And in your own plan what is the radius?

Mr. Boyer. The Limerick exclusion area is 1.3 miles, 1.7 in the immediate zone which was required for evacuation.

Mr. Kostmayer. 1.7 miles?

Mr. Boyer. 1.7 miles.

Mr. Kostmayer. Do you still feel that is adequate?

Mr. Boyer. That is more than adequate.

Mr. Kostmayer. As you recall, during the TMI accident Governor Thornburg had an area around the TMI plant which was somewhat larger than that?

Mr. Boyer. I also recall that the evacuation of Three Mile Island was not necessary. It was a result of poor communications between various groups.

Mr. Kostmayer. As you know, the Nuclear Regulatory Commission has also proposed a rule which would make an operator's license contingent upon State and local governments having a federally approved evacuation plan, which is not the law currently. Can you tell me whether you favor that rule or are opposed to it?

Mr. Boyer. I make no comment on that. It has to be procedure for getting plants licensed, you cannot give one small group a veto over a project that is going on over a number of years in which a considerable amount of dollars is invested. It has to be on a reasonable basis.

So I am sure in our normal way in which we work problems out like that where everyone gets a chance to have their say and come down to concensus of opinion and through congressional action, if necessary, that a reasonable requirement will come forth.

Mr. KOSTMAYER. But you feel that the State should not be required to have an evacuation plan approved by the NRC before you receive your operator's license?

Mr. BOYER. Again, you may be trying to nail me down to specifics on what is the problem with the evacuation plan, have the plans been submitted, why have they not an approved plan and so forth?

Mr. KOSTMAYER. You mean the plan which the utility submitted?

Mr. BOYER. No, the State.

Mr. KOSTMAYER. The State has submitted a plan, but it is not a question of law. It is a voluntary action. They have no requirements that they do so. They have just submitted one, but it was not in effect, as you know, during TMI.

What the NRC is proposing is that the operator's license be contingent upon the State submitting a plan. That is not the case today, although there is a voluntary action.

Mr. BOYER. As I stated, with the evacuations which have been performed around the country and around the world, there is not a need for that requirement.

Mr. KOSTMAYER. There is not a need for that requirement?

Mr. BOYER. Right.

Mr. KOSTMAYER. What if there were a serious accident at Limerick which extended beyond the 1.7 miles and there were no State or local evacuation plans?

Mr. BOYER. There are State and local evacuation plans existing today.

Mr. KOSTMAYER. But not concurred in by a Federal agency?

Mr. BOYER. What good is concurrence? It is the people on the scene and people who are knowledgeable who are doing the evacuation, not somebody sitting up in some office making approval of plans.

Mr. KOSTMAYER. So you do not feel that the Federal Government has the responsibility to approve those plans; you simply think that the current system, I gather, is sufficient?

Mr. BOYER. I say a reasonable system will evolve from the review process.

Mr. KOSTMAYER. A reasonable system will evolve from the review process?

Mr. BOYER. Right.

Mr. KOSTMAYER. I wonder if you could answer this question. In the event of an accident which would take us beyond 1.7 miles, and there were areas that had not evolved—

Mr. BOYER. There are plans available now. There was a group that was up here at this table just before me and stated that they had plans and were able to take care of evacuation.

Mr. KOSTMAYER. And did you hear the testimony from the Federal Emergency Management Agency?

Mr. BOYER. Yes.

Mr. KOSTMAYER. You have no reservations about the way they are handling this?

Mr. BOYER. The Federal Emergency Management Agency is a new agency which will be supplementing work that has always been before that. They are getting organized and getting their plans developed and I am sure they will have good plans come out of that.

Mr. Kostmayer. I recognize the gentleman from Kansas at this time.

Mr. Glickman. Mr. Boyer, I am probably, on the merits of nuclear power, closer to you than anybody else on this panel. I think the industry seems to believe that evacuation plans acknowledge the ultimate defects of nuclear power and I remember we had an issue on the floor, an amendment from a colleague of ours from Oregon to require these plans before operating licenses and the industry fought that amendment very, very hard, and it just struck me in my judgment that reflected a very poor judgment on the industries, reflecting what I consider to be a continuing of very public relations techniques, to be on record fighting evacuation plans.

Now basically from what I hear you are saying today, you are not fighting any evacuation plans, and that you are going to accept responsible, reasonable evacuation plans promulgated by the NRC; is that correct?

Mr. Boyer. If they are put into force, we will certainly abide by them.

Mr. Glickman. Are you fighting them?

Mr. Boyer. We are not fighting them, no. We are trying to get reasonable requirements instituted.

Mr. Glickman. I think we got to finish these plans, providing that the technical operations are safe. I cannot for the life of me understand why anybody would ever oppose an evacuation plan.

Mr. Boyer. There are currently emergency plans by State and local groups. Now it is a question of degree as to how formalized those plans should be, how many times should there be drills, et cetera, to be able to take care of some potential emergency.

If you want to have this for nuclear facilities, let us look at other hazards to the public and do it on a uniform basis. We have no objections then. Treat railroad car derailments as potential hazards, explosions and other things of this same manner; lump them all together, fire, flood, et cetera.

Mr. Glickman. Well, we know that life is not perfactly fair and we know that right now the focus is on your industry and I do feel that maybe there are other hazards to explore. I am just saying for your own good, I do not think it is in your company's best interest to even have the perception not to try to work for reasonable evacuation plans.

Mr. Boyer. I did not say we were not supporting them nor working for them or with them. You asked me or I was asked whether the detailed plans were an absolute necessity or whether someone should have approval of detailed rights and I gave my answers to those questions. I did not say that in today's environment that it is reasonable to expect nuclear power to go forward without having better defined emergency plans than were available before

Mr. Glickman. Let me go into a couple of other questions. There has been some discussion about excess capacity, and I do not know if you were here when the gentleman from——

Mr. Boyer. No; I was outside, but I am familiar with that subject.

Mr. Glickman. I wonder if you might just touch on that for a minute. The statistics indicate that electricity consumption over short-run may not be increasing as fast as it had been and, in fact, it may be decreasing. I wonder if you mind talking about that?

Mr. **Boyer.** Excess capacity was an issue in prior years. It is not an issue with regard to the completion of Limerick station. Limerick station will save customers money, dollars in their electric bill, from the first day it goes into service. The fuel savings, that is, the alternate fuel that will be replaced by using nuclear fuel instead of a mixture of coal and oil, the fuel savings will more than pay the capital carrying charges and the operation and maintenance of the Limerick facility.

So whether we have excess capacity or not, it is a nonissue. We are going to be displacing the oil-fired units with internal combustion units, which the Public Utility Commission 10 years ago encouraged us to add to our system and increase our reserves.

Mr. **Glickman.** What is the price of uranium compared to last year?

Mr. **Boyer.** Last month fuel charges to Philadelphia Electric Co. customers were four-tenths of a cent a kilowatt hour of nuclear fuel; 1.5 cents for Philadelphia coal and 5.4 cents for oil. There is a difference of 5 cents when you generate with oil.

Mr. **Glickman.** How does that compare with last year at this time?

Mr. **Boyer.** Nuclear fuel has gone up slightly, maybe it was a half cent, 5 mills less last year. Nuclear fuel costs have levelized and actually dropped a little bit. Coal has escalated over the last 10 years from 1970 to 1980, the average rate of escalation of coal prices has been 16 percent. The average rate of escalation over the last 10-year period for oil has been 33 percent. Now our oil prices doubled last year, doubled. Our coal prices went up about a little more than the rate of inflation. Any economic evaluation for nuclear power in the future has to be based on some projections of fuel cost. We have taken fairly conservative estimates of fuel cost escalation for coal and oil, and oil you can just cross off. In our estimates which show that Limerick is going to save the customers money.

People have trouble realizing this that the escalation of fuel—— [Mr. Boyer turns to address the audience as heckling begins.] Well, you do. You complain about high bills and then you do not want a nuclear plant. You are arguing against yourselves.

Mr. **Kostmayer.** Mr. Boyer, please address the members of the committee.

Mr. **Glickman.** Let me just ask you two more questions. One is, is there a full-time NRC inspector onsite at Limerick now?

Mr. **Boyer.** Both at Limerick and at Peach Bottom.

Mr. **Glickman.** In addition to rotating inspectors?

Mr. **Boyer.** Yes.

Mr. **Glickman.** Any of your staff at Limerick or in your central office devoted full time to the issue of evacuation plans?

Mr. **Boyer.** Well, our operating force has a person, they have been following this and they have a person assigned to this and he has been, he and some other people have been meeting with these various agencies.

So I would say, yes, we have more than one assigned to that.

Mr. **Glickman**. And my final question, just for my own information, I have some investment bankers that have been telling me that the utilities of this country are generally maybe in serious financial trouble down the line. I do not know anything about your company, but what happens to you financially if Limerick is not built, and assuming there is no other Chrysler bail-out type of situation for you?

Mr. **Boyer**. I decline to comment on that question.

Mr. **Kostmayer**. The gentleman from Massachusetts, Mr. Markey, is recognized.

Mr. **Markey**. Thank you, Mr. Chairman.

Do you think the 1.7 mile radius of protection is adequate?

Mr. **Boyer**. Yes.

Mr. **Markey**. That presupposes that a worse-case core meltdown cannot occur at your plant or any other plant; you do not think it can occur?

Mr. **Boyer**. Even if it did, the activity would be contained in the plant and would not require evacuation beyond that radius.

Mr. **Markey**. We know that [word inaudible] water reactors cannot explode, but they do contain radiation 1,000 times greater than that——

Mr. **Boyer**. That is just a statement that has no meaning.

Mr. **Markey**. Well, it does have meaning. [Next sentence drowned out by audience.] You say it cannot occur and we have to accept your statement as being the final word on the subject when, indeed, that is not the case whatsoever. If you are correct in that 1.7 miles is adequate, if you are correct, we do not need any evacuation plans at all because an accident cannot occur and none of these people have anything to worry about whatsoever. But my contention is, and the other people's contention is, your plant may not have an accident and this one might not and that one might not and it may not be any of the 150 plants in this country, but one of them, someday, somewhere because of human or design failing is going to have that accident either 5 years from now, 10 years from now or 30 years from now.

What these people are saying, they do not want to be part of this Russian roulette, they do not want to be like the people of Love Canal and say, well, it might not be my neighborhood so I do not want the extra on my rate base. So Love Canal might not be in your neighborhood and Limerick may not be the plant to have a serious accident, but it just might be the plant that somehow or other with faulty personnel at sometime in the future, something's going to go wrong and you do not have that protection and——

Mr. **Boyer**. Are you asking me a question?

Mr. **Markey**. The point is that within 24 hours, a lethal dose of radiation could be delivered within 4 hours inside an area 6 miles long and 1 mile wide.

Mr. **Boyer**. Based on what?

Mr. **Markey**. Well, surely not your studies, but other studies which indicate that there is likelihood of that.

Mr. **Boyer**. If we thought that or there was a chance for that, we would not build the nuclear plants.

Mr. **Markey**. Well, that is not so. There are a lot of new rules which existed when you were first planning Limerick back in the late 1960's and 1970's which no longer apply.

Mr. BOYER. But we still live and work in this area. We would not put in something which would ruin our customers and our employees and our own livelihood.

Mr. MARKEY. I am sure it was done with all the best intentions and the best designs known available in the late 1960's and the scientific evidence which was available, if you designed this plant in the late 1960's. What I am saying is the rules have changed. That in post-Three Mile Island we no longer take that kind of casual and almost irreverential attitude toward nuclear power now that the public once had.

Now there is some questioning which is occurring. The county commission says that there is no way that the NRC with its staff and personnel is capable of insuring any measure of safety for nuclear powerplants. If indeed they went back and they were going to apply the same type of criteria for all plants that would be guided by the old NRC regulations, that they were going to apply today the new regulations that are going to be promulgated for plants built in the future, there are very few that might be able to stand the scrutiny applied to them.

What we are saying, this plant was built largely under old rules. Now you are trying to make technical adjustments in operating procedures in the control room, but still there is a large number of design features built into this plant, but because of pressure of financial consideration——

Mr. BOYER. Now that is not true, I will not let you claim that against Limerick.

Mr. MARKEY. You cannot tell me——

Mr. BOYER. You point out an incident. We have been responsive to all of the requirements; we have made voluntary changes and that plant has been designed with safety as a foremost issue since the day we started it and I will not let you make a statement such as you were making. I am sorry. I just will not.

Mr. MARKEY. It has been my experience in looking at——

Mr. BOYER. What is your experience?

Mr. MARKEY. My experience on the Interior Subcommittee, my experience in listening to the Kemeny Commission——

Mr. BOYER. Did you read the supplemental reports of the Kemeny Commission, a large number of volumes that say in there that Three Mile Island had meltdown through the reactor vessel and in the containment and that there was still no hazard offsite to the public?

Mr. MARKEY. The limited number of scenarios in determining whether or not radiation exposure would occur from a nuclear meltdown was limited. It did not take into consideration all the kinds of situations which could occur. I think for us just to be limited to that one incident in the total analysis which was made of it would be crazy. I think we have to indeed look at all the possible unknowns, and that is what we are dealing with here. We are dealing with human beings, we are dealing with a technology which is impossible for us to completely comprehend and what we are saying, God forbid an accident does occur, and none of us want an accident to occur, why can we not expect to have the maximum amount of public protection built into these plants to assure that if something does go wrong——

Mr. BOYER. What else do you want? We are doing that.

Mr. Markey. The attitude you give us today, what I hear from you is that you think 1.7 miles is adequate, you do not really know why we need Federal approval of the local and State plans.

Mr. Boyer. I said, it should not be held up, the licensing should not be held up on a hypothetical case. Now if you want to get down to specific cases, but you are dealing in estimates here.

Mr. Markey. The American Nuclear Energy Council calls public safety standards, that is evacuation plans, a guillotine for nuclear power How can emergency plans be a guillotine? I think that is the kind of attitude that makes people skeptical about the willingness of the industry to monitor itself. To be able to build in the kind of protection that the public is going to need in case of an accident to insure that the public health and safety is going to be well prepared for and anticipated and I think that whether you are pro or antinuclear, the NRC, the Kemeny Commission, all the Commissions have recommended far more comprehensive evacuation plans than you are seemingly willing to do.

Mr. Boyer. You asked me whether it was required. I told you we would accept the plan, we would work with the agencies and comply with them. You asked me whether it was needed or not and I said, it is not needed, but it is a natural aftermath of Three Mile Island. I expect it to occur and I do not expect a 10-mile distance to be relaxed very far. It may come back in a little bit, but from the political reality of things, it is going to stay out that way and we will be prepared to evacuate people out to that point.

You asked me whether it was a necessity or not and, no, it is not, but we will be prepared to do that.

Mr. Markey. In looking at the question of coal versus nuclear, in 1957 when you first planned this plant, what did you project the cost to be?

Mr. Boyer. You are talking about Limerick?

Mr. Markey. Limerick.

Mr. Boyer. $700 and some million, $775 million.

Mr. Markey. What do you now project the cost?

Mr. Boyer. $3.200 million.

Mr. Markey. I think that the same kind——

Mr. Boyer. What was oil projected to cost back in those days?

Mr. Markey. I wonder whether or not your analysis of coal versus nuclear has given full weight to the traumatic increase in coal production in this country, opportunity for transportation, the increasing competitiveness of coal versus nuclear and——

Mr. Boyer. Coal plants are also going up and coal plants today, with the environmental requirements, their cost has gone up at a faster rate than nuclear plants. We are also upgrading two of our plants that burn coal to be able to meet the environmental requirements and it is going to cost us $330 million in the next couple of years.

So do not think that coal is cheaper and it does not cost money to be able to burn coal in an environmentally acceptable way. The air and water regulatory requirements, which the public seems to want, are expensive. That together with the mine regulations has pushed the cost of coal up and I quoted the figure the last 10 years and I will give it to you for any year that was between from about that point on until now; coal has escalated 15 percent a year. That is a fact. It is not a guess; that is a fact.

Mr. **Markey.** The cost of building coal-fired plants, though, is not escalating as fast as nuclear powerplants?

Mr. **Boyer.** Yes, sir; with air pollution requirements and water requirements, it has. In fact, it has increased at a faster rate.

Mr. **Markey.** Not over the timespan we talked about.

Mr. **Boyer.** What timespan are you talking about?

Mr. **Markey.** Over the last 10 years.

Mr. **Boyer.** Yes; it has. That is when the environmental regulations came in and that was the only reason, that plus the oil embargo and the high price of oil is really the reason that nuclear power is so economic today.

Mr. **Markey.** I will conclude, Mr. Chairman, the most recent economic analysis that I have seen of coal versus nuclear——

Mr. **Boyer.** Who said?

Mr. **Kostmayer.** Mr. Boyer, if you would allow Congressman Markey to complete his questions.

Mr. **Boyer.** He will do that. I asked him to give me basic facts because it may be factual or it may not be.

Mr. **Markey.** I will send you a document. I am sure that your objections will continue that nuclear power as a source of energy would not be as dramatically increased in cost as it has over the last couple decades. We originally were promised back in 1950 that nuclear power would be too cheap to meter.

Mr. **Boyer.** That was a statement of what was the escalation rate.

Mr. **Markey.** I think what we found is a switch has occurred. [Witness drowned out by audience.] Now we go back 25 years later and we turn to a technology that is not only safe, but also not as economically feasible as other technologies. If we made the investments or 25 years ago on coal and solar [rest of sentence drowned out by audience].

Mr. **Kostmayer.** I recognize with trepidation for fear that my colleagues will never return to Pennsylvania again, I recognize the gentleman from Nebraska, Mr. Cavanaugh.

Mr. **Cavanaugh.** Thank you, Mr. Chairman.

On page 8 of your testimony, you set out design changes that have occurred at Limerick since 1970 in response to, I guess, changes in attitude and approach about nuclear——

Mr. **Boyer.** Well it was a recognition where Limerick is located.

Mr. **Cavanaugh.** Could you tell me what the cost of those design changes have been, which I do conclude and determine from your statement are to achieve a greater degree of structural safety for the facility, as you say, based upon the location of the facility?

Mr. **Boyer.** Both were structural and also operational since the charcoal waste gas [rest of sentence inaudible]. I cannot really give you a total cost of all those. They were done in different timeframes and it is up to the multimillion dollar, hundreds of million dollars now. It is probably 10 percent of the cost of the plant.

Mr. **Cavanaugh.** And these are changes, design changes, instituted prior to Three Mile Island. What has been the cost of design changes to enhance the safety of the structure and operation since Three Mile Island?

Mr. BOYER. Well, they have not all been developed yet. Most of the things have been more in the training and procedure area, upgrading their procedures and additional training. We may have added some additional shift personnel. We have to have a technical support center, an emergency news center, an emergency operations center and we have to build a facility to do that.

It has been estimated that most of these things run in the order of $20 to $30 million.

Mr. CAVANAUGH. That is your total estimate now for additional structural design and operational changes to accommodate new safety perspectives?

Mr. BOYER. Yes.

Mr. CAVANAUGH. It is reported that there are extensive reports in the Philadelphia Inquirer, I guess, on March 23 in which they indicate the possibility of the NRC requiring more substantial design changes and they suggest either a core catcher or additional filtering system and the story goes on to report that Philadelphia Electric officials currently have no plans for either of these changes.

Could you comment on why you do not believe that those particular changes would be needed?

Mr. BOYER. Well, that I will refer to the probabalistic risk analysis, which we are presently conducting for Limerick to show, to analyze the Limerick plant at its site with its design features and look and make similar comparisons to that of which was made, the WASH-1400 Rasmussen study, updated by the Lewis report, to see how Limerick compares to the standard plant which is acceptable.

We feel with the features we have incorporated in Limerick, they will more than offset the increased population down rate, so to speak, and nothing else will be needed. The NRC is asking us to do this study and has commented that if the study should come out and show the plant on a comparative basis was less safe than WASH-1400 basic plant, that maybe some additional technical features might be needed such as a core catcher or filtered vent.

The filtered vent is a large filtration system with sand bed covers or something like that to be able to vent the contents in the containment to minimize pressure and to be sure to absorb any particular matter so there would be no gases. We basically have that inside our containment now, inside the reactor building that surrounds the containments. So a leakage from the containment would have to be treated naturally in the same way.

The core catcher is some hypothetical device so it does not meltdown through the concrete, which is a hypothetical accident.

Mr. CAVANAUGH. A core catch does not exist?

Mr. BOYER. It does not exist for any plant to my knowledge right at the moment. It was considered in the initial plant design back when it was being licensed and they added some additional safety features instead of that.

At Indian Point and Zion, the owners of Indian Point and Zion are presently conducting a similar study of that which we have been asked to conduct for their plants and we expect the results to be the same. If they do not match, they probably will have to put in something. If they show that their features more than compensate for the population density, I would expect they would not have to add anything.

Mr. **Cavanaugh.** At this stage in the construction of Limerick, is it still possible to install a core catcher?

Mr. **Boyer.** Since it is not designed, it is a little difficult to say. Some people have looked at concepts of that, but sure, it would be possible, I believe, to add from a very, very, very preliminary look at it.

Mr. **Cavanaugh.** I take it there is no cost estimate for that?

Mr. **Boyer.** I do not know—cost estimates for a core catcher at Indian Point is, I do not know the exact number, it is probably a few million dollars, estimated at about $23 million or something like that. That would not affect my $30 million estimate because I was giving you a fairly high conservative estimate. Plus or minus 10 percent is not going to make much difference when the plant is costing $3 billion and you are going to save $250 million a year, $400 million a year to customers on the first 5, 6 years. So $30 million is not a large number.

Mr. **Cavanaugh.** Do I understand your view of evacuation plans which would extend to a geographic area of 10 miles to be practically of no necessity, but motivated by political response?

Mr. **Boyer.** They are motivated by unknown concerns; they are hard to combat. So you go ahead and do the last giant step; just like walking the last mile to have that contingency available to you. The population density in that region is somewhere around 600 people per square mile. You heard Mr. Denton this morning say 500 was an acceptable number to the Commission when they review sites. So we do not think Limerick in the 10-mile region is that populated.

Mr. **Cavanaugh.** But the design changes that you say that you made since 1970, you say you made in response to your concern for the population density?

Mr. **Boyer.** I said when we located Limerick where it was and realized what the population density was, we added the additional design features in the plant over what we might have said let us design the system this way if it had been a plant that was way out in an uninhabited region.

Mr. **Cavanaugh.** I hate to identify with my colleague from Massachusetts, but he did make a point earlier to Mr. Denton that I think is a sort of concern that we would go down the road of different technological standards based on the population density of the location of the facility. Does that seem to you to be a prudent way to design plants?

Mr. **Boyer.** When you get into this numbers game, that is what you end up with. Basically, the plants are safe. If you want to design a plant that is safe, say it is safe anywhere and you put it in the center of the city or put it out in the boondocks, and it would still be safe. That is the way we are moving on the design and operation of these plants.

Mr. **Cavanaugh.** The design alterations that you detail on page 8 of your testimony were not necessary in your judgment; are you superfluous?

Mr. **Boyer.** Well, design margin on essential piping systems gave us additional—we upgraded the design requirements of piping systems above what the code required to give us greater reliability and assurance of freedom from any problem with cracks or failure of the piping systems. We put an extra margin of safety in.

We also did it from the standpoint of reliable plant operation. We are spending a lot of money for this plant. It is not any good if it is down, it has got to produce power.

So we felt we wanted to provide the highest degree of reliability in operation in the plant design. That is what the improved piping margin does. It also gives you some protection against accidents or failures. But reliability is reliability. Improved shield components and installation of vibration monitoring systems are just things that would detect potential problems earlier.

Mr. Cavanaugh. But do not substantially add to the safety of the plant?

Mr. Boyer. No. Increased size of design is really a requirement by the NRC and our final ACRS review. We were debating various earthquake requirements at that time and in the end they added another 10 percent or 15 percent on our design requirements.

So we cannot necessarily take full credit for that one. It was an NRC requirement in the final review of the plant. It does make the plant—it ends up with a plant built for a much greater earthquake design criteria than we would ever expect to find around this area, so it has additional design margins.

Mr. Cavanaugh. And a leak-tight reactor building was unnecessary?

Mr. Boyer. Well, that is in recognition of the population around the plant and the relatively small evacuation or low population zone.

In a more remote location, you would not need that. You would have a greater distance. If the 1.7 miles had been 5 miles, we would not have needed that to meet requirements. And people living around Peach Bottom, you can go down there and I can show you the records—there have been no exposures from Peach Bottom which does not have that extra feature.

Mr. Cavanaugh. And the chilled charcoal waste gas treatment system?

Mr. Boyer. Same basic purpose.

Mr. Cavanaugh. As a leak-tight——

Mr. Boyer. As the leak-tight building.

Mr. Cavanaugh. There is no difference between the two of those?

Mr. Boyer. Well, one of them is a continual release off gas and the condenser and the other one is only under accident conditions.

Mr. Cavanaugh. None of these requirements in your judgment were basically necessary; these were impositions placed upon you because of external judgments?

Mr. Boyer. No; I would say the chilled charcoal and the leak-tight building were conscious design features which we, Philadelphia Electric Co., made to benefit our plant at the site. We may not need to go all the way to the chilled charcoal. We could have put an elevated stack-up or something like that to minimize releases.

So we wanted to do everything we could to minimize radioactive releases from the plant from a normal operation to an emergency basis. These features were incorporated to accomplish that.

Mr. Cavanaugh. Finally, I want to go back a little bit here and clarify Mr. Denton's statement, which was in strong controversy. He did say his entire statement on emergency planning was, he stated:

> Significant changes have taken place in the NRC's approach to emergency planning. In the past, the NRC staff relied primarily upon plant design features for protection of the public. Our current approach places significantly increased empasis on emergency planning as the necessary additional measure required for the protection of public health and safety.

Now do you find yourself; in agreement with that statement, or in disagreement with that statement?

Mr. Boyer. I am in disagreement with that statement.

Mr. Cavanaugh. You are in disagreement to the extent that——

Mr. Boyer. We now find that there are additional measures needed for whatever it says in there about emergency plans. That is not true in my opinion.

Mr. Cavanaugh. Well, is it true that no plan for emergency evacuation and planning as to the public safety and health is necessary?

Mr. Boyer. I am saying that there are plans in place by the Civil Defense agencies to adequately cope with an emergency, if it should occur, to protect the health and safety of the public. Anything you do to more formalize those plans, to dress them up a little bit more, put names and telephone numbers on a sheet and so forth, you are going to streamline the activities and, therefore, perhaps be able to accommodate them in a little more expeditious manner and perhaps a shorter amount of time. But I am saying that that is not necessary.

Mr. Cavanaugh. That does not add to the public health and safety?

Mr. Boyer. It is an incremental improvement which is not necessary.

Mr. Cavanaugh. Why?

Mr. Boyer. Because the plants are going to be safe, we are going to operate them safely and we are not going to release any activity off the site.

Mr. Cavanaugh. So to reduce your view to the most elemental form, emergency plans are not necessary because emergencies will not occur?

Mr. Boyer. Emergencies that require evacuation will not occur.

Mr. Cavanaugh. Your view is that that is true of the operation of any nuclear plant in this country?

Mr. Boyer. I can only speak for the plants that I have responsibility for.

Mr. Cavanaugh. But you are speaking now to the Congress of the United States.

Mr. Boyer. It would certainly apply to all others. With the things that are being put into being, I mentioned the NSAC organization—the Nuclear Safety Analysis Center; I mentioned INPO—Institute for Nuclear Power Operations. Those two bodies and with the work they are doing are going to assure that there are no weak systems. I am not saying that Three Mile Island was a weak system. I do not know the organization that well. But they are going to assure that things do not fall into a crack such as they did prior to Three Mile Island on the lessons learned on the licensing event report. There was a flag out there waving that a plant had a similar problem and if the operation of Three Mile Island had been aware of it, we would not be sitting here today, I guess.

There were also improvements in the training program. We are using the best techniques. Everyone will be using the best techniques. There will be audits conducted by INPO for not only the operating force, but for the management force. I will be audited by INPO as the management of our company will as to how we conduct our operations. If this is done for every utility that is operating a plant, we are going to have a uniform high quality of operation of these plants.

Mr. CAVANAUGH. Without the involvement, active involvement, of either the Congress or the Nuclear Regulatory Commission or the Federal Emergency Management——

Mr. BOYER. That is the only way we in the industry can keep nuclear power as a viable option for reducing our oil imports.

Mr. CAVANAUGH. By maintaining——

Mr. BOYER. By maintaining good operation records. We cannot have another Three Mile Island again and expect to have nuclear power continue.

Mr. CAVANAUGH. I would agree with that.

I would just make one suggestion to you. I would like to be sympathetic with your position, but I have to frankly say that you make it difficult for anyone to be sympathetic because you exude an attitude, perhaps unintentionally and I would suggest it is unintentionally, of a lack of concern for public fears and concerns.

When you attempt to equate the potential consequences of a nuclear powerplant emergency of some kind with a train wreck or fire or some other disaster that can be experienced in our society, I think that you diminish your own credibility by not acknowledging and relating to the facts that nuclear energy is an item of unique capabilities both for good in our society and also in terms of its destructive capacity. To try to present to the public an image that is no greater or lesser an evil or good or danger than fire or accident I think does serious damage to your own presentation of the issue and lessens a reliability——

Mr. BOYER. You overstated my [Rest of sentence drowned out by audience.]

Mr. CAVANAUGH. And to say that the efforts to plan for emergency are window dressings because emergencies will not occur, I think that does great damage to what you eventually want to accomplish, which is to meet the energy needs of the people of your service area in an efficient and economical way.

I hope you will take some friendly advice and try to develop some empathy for the real concerns that do exist and some appreciation for the fact that you do not have to stonewall or demean other points of view in order to effectively contest them and that there are perhaps more palatable and effective ways of accomplishing your goal of meeting the energy needs of the people.

Mr. BOYER. I also have great concern to the supply of energy for the people in this country. Nuclear energy and coal are the two fuels that we have, and we are going to be using both. Otherwise, we are going to be in some great difficulties.

Mr. KOSTMAYER. Mr. Boyer, I want to thank you for appearing before this subcommittee. I must say with some reluctance, I do not question your sincerity. Really I do not. I do not believe you would be involved in the construction of a facility which you thought would jeopardize the lives of your own family, your own employees and the citizens in this area. I do not question your sincerity. I believe that you are a sincere, decent individual.

Putting aside the merits of what you said, I do think that Congressman Cavanaugh has made a point. Perhaps you came here with a belligerent attitude. I think you probably did yourself a little bit of damage today in terms of how people feel about Philadelphia Electric and its commitments to the people.

I appreciate your candor. You have been very candid, but I wonder if you feel that you jeopardized the possibility of being granted an operating license down the road by your testimony today. There are representatives of the Nuclear Regulatory Commission here. You have said you will "comply" with the law and we appreciate that, but you seem to disagree on almost every point with the Federal agency which has responsibility of regulating your industry.

I wonder if you would just comment on that?

Mr. **Boyer**. I do not believe that is true. I believe you are exaggerating. Go back and read the record; that is all I can suggest you do because I certainly believe our relationship with the NRC has been good and I expect Limerick to be licensed because it will meet the requirements and it is going to be a good plant which will provide low-cost energy, cut off our oil imports and supply our country with a good, safe form and environmentally safe form of energy.

Thank you.

Mr. **Kostmayer**. Thank you very much, Mr. Boyer.

AFTER RECESS

Mr. **Kostmayer**. Our next panel is Dr. Judith Johnsrud, codirector of the Environmental Coalition on Nuclear Power, and Dr. Chauncey Kepford.

I notice that both of your statements are rather lengthy. In the interest of time, since it is getting late, I would hope that you would summarize the statements.

[The prepared statements of Dr. Judith Johnsrud and Dr. Chauncey Kepford may be found in the appendix.]

PANEL FROM THE ENVIRONMENTAL COALITION ON NUCLEAR POWER CONSISTING OF: DR. JUDITH JOHNSRUD, CODIRECTOR, AND DR. CHAUNCEY KEPFORD

Dr. **Johnsrud**. We had hoped to present our full statements, but certainly in consideration of the audience as well as everyone else, we will summarize our statements so that we will have time for questions.

My name is Judith H. Johnsrud. I am codirector of the Environmental Coalition on Nuclear Power, which is a public interest organization founded, oddly enough, about 5 miles from the Limerick nuclear site in 1970. It is one of the oldest grassroots citizen groups in the Nation specializing in research, public education and litigation pertaining to nuclear power, the nuclear fuel cycle and safe energy alternatives.

On behalf of our members and particularly our members of eastern Pennsylvania in Bucks County and members of the Limerick Ecology Action, we are very pleased to have this opportunity to testify before this committee and we appreciate your invitation.

Limerick has been indicated a number of times among the most hazardous sited nuclear powerplants in the United States. I would add, it is one of the most hazardous sitings for a nuclear powerplant under construction and perhaps that very fact gives us an opportunity with respect to Limerick and the other ones in that category are Indian Point near New York City and Zion, near Chicago.

I would like to address a few comments later in my remarks to issues that appear to be of relative importance to evacuation planning, emergency planning for Limerick, and the issues of Lessons Learned from Three Mile Island, but as the vice chairman of the Pennsylvania Governor's Advisory Committee, I think it is more important to address comments on the viable alternatives to nuclear powerplants such as Limerick. They exist, they are not costly beyond our capacity and perhaps we must come to them sooner than later.

By way of background, I think it is fair to say that the utilities of Pennsylvania and New Jersey were told to believe that nuclear power reactors would provide safe, clean, reliable, and inexpensive electricity. Their reluctance to invest was lessened by the Price-Anderson Act of 1957 and its renewal in 1965 reducing their liability in the event of a nuclear reactor accident, such as had been analyzed in the 1957 Brookhaven report. Subsequent review of that report by the Atomic Energy Commission in 1964 and 1965 was designed to assess greater hazards. The results of that were suppressed until 1973. I commend those working papers and they should be carefully reviewed by this committee. The Brookhaven-AEC researchers concluded that a nuclear reactor accident that resulted in a breach of the containment structure could indeed have catastrophic consequences at large distances from a reactor, not merely 10 or 20 miles.

I would like to draw your attention to the comments and conclusions that were drawn in the minutes of some of those deliberations from mid-1960 at the bottom of page 2 of my prepared testimony and I quote the Steering Committee mainly that if the containment works, there is 100-percent retention, which is what we all hope for, but in the event that breach of the containment occurs and there is a release of radioactive materials, there would be very high levels of radioactivity for a distance of 100 kilometers. They found that at 100 kilometers, the levels were still 100 times the PAG. The result if a city were involved would be catastrophic and there would be deaths out to 150 kilometers. That is not 10 miles or even 50 miles; it is approximately 90 miles. Three Mile Island lies about 90 air miles upwind of Bucks County. New York City is approximately 90 miles from Limerick. Philadelphia, which is an entire metropolitan area, lies approximately 50 miles away from this plant.

Further, over much larger distances in excess of 600 miles or 1,000 kilometers, it was concluded 15 years ago that we can expect a higher level of contamination that would affect the thyroid.

Now many people have mistakenly assumed that the Rasmussen report, the reactor safety study, superseded the WASH-740 report. In fact, the Nuclear Regulatory Commission does not so state and the NRC does not deny the AEC's earlier grim conclusions that were quoted here and, in fact, attempted to repudiate the existence of its predecessor's findings only by simply ignoring them. It should be noted further that the original 1957 Brookhaven report had stated in the final paragraph of the introduction that there are a few less usual weather conditions which occur perhaps 5 percent of the time and which could yield estimated damages outside the range of the figures stated in the Brookhaven report. Those weather conditions, of course, would be conditions of temperature, stagnate areas, precisely the weather conditions that afflicted Pennsylvania for the 6 terrible days for the Three Mile Island crisis

Against this background of the area that could be lethally affected by the breach of containment accident and the uncertainty of the upper bounds of damage potential, we must examine the history of the siting and licensing for Limerick and the second pair of reactors planned for, and Mr. Kostmayer backed me up, that were similarly proposed in the end of the 1960's and were successfully opposed by the residents of Bucks County, Indian Falls Township and the Environmental Coalition on Nuclear Power.

I served as a witness in the construction permit proceedings for both Limerick and I must take exception to Mr. Denton's comments this morning that there were no population criteria at the time. There certainly were. They are to be found in the Code of Federal Regulations, title X, part 100. I direct that exercise and reading as well to you.

Limerick was sited, of course, on Schuylkill Valley property belonging to Philadelphia Electric and it was one of the last remaining open corridors in the vicinity of Philadelphia. At that time, a study of the population expansion potential, transportation routes and the possibility for evacuation routes in the vicinity of both Limerick and Newbold Island. In the case of Limerick, there was proposed expressway construction, the proximity of Pottstown itself, the stability and attractiveness offered by the Valley Forge National Historical Park, all contributed, in my opinion, to the growth and pressure for growth and development in adjacent Montgomery and Chester Counties. The predictions of 8 years ago have come to pass, even as the construction of Limerick has slowly progressed.

I would note in those same construction permit hearings, Mr. Thomas Gerusky, director of radiological health in Pennsylvania, had testified in 1972 and stated that prompt evacuation of pregnant women from the Pottstown area could not, even then, be assured to protect them from unacceptably high radiation doses in the event of a design basis or class 8 accident at Limerick. Unless the Commonwealth of Pennsylvania was not pleased to see the Limerick plant constructed at this site.

Consideration of class 9 accidents of the variety that occurred at Three Mile Island accident or worse were excluded by the AEC Licensing Board as being too improbable to merit examination of such accidents or their consequences. This exclusion is still the practice of the Nuclear Regulatory Commission today, even since TMI demonstrated not only that a class 9 accident can occur, but has occurred within the initial 100 days of operation.

We believe that Congress, in the exercise of the power of the purse, has full authority to require that the NRC undertake full accident consequence analysis as well as full compliance with the National Environmental Policy Act in the licensing and continued permission to operate licensed reactors. We think it is in character that such pressures be placed upon the Nuclear Regulatory Commission to do their job.

And yet, the construction of Limerick has been allowed to continue, despite the demonstrated need for an evacuation plan.

I guess I should add before I leave the topic of Limerick, I recall on the 26th hour of the Three Mile Island accident on March 28, I received a phone call from a State official who was actively involved in nuclear powerplants and his comment to me was, there is only one utility in the Nation that could have botched it worse than Metropolitan and that utility was Philadelphia Electric Co.

Equally instructive to this subcommittee is the history of Newbold Island. It was to be built right in this county. At the AEC construction permit hearings, the people were able to show the total inadequacy of the applicant's analysis of the size of the working, transient and anticipated populations and also the growth potential at that site. The AEC staff refused to back Newbold Island and it was removed from the center of the metropolitan area.

But note that the AEC's Licensing Board did not deny a construction permit, but rather the staff threatened to oppose the applicant unless the siting change was made. In our view, there was a tradeoff that said the rights to protection from the risk of a catastrophic reactor accident were to be given to an urban population by moving Newbold Island down to the planning site in south Jersey, the Atomic Energy Commission was saying they would deny that right to rural residents solely on the basis of population density.

In our view, this agency's siting decision constitutes unequal protection under the law to individuals who live in low populated areas.

Further, no consideration is given to—for example, it is very difficult to notify rural people, nor are they willing to simply just pick up and evacuate or abandon their domestic animals. This point was poignantly raised by the Amish folk of central Pennsylvania following the aftermath of Three Mile Island. Not only had they not been notified, but they had no notion of what a nuclear reactor accident could do to them.

Furthermore, in response to Newbold Island, the utilities moved in an opposite direction. They moved to the rural areas. They moved to build a complex of 20 nuclear reactors and coal-fired plants on a single massive site in Pennsylvania. Pennsylvanians said "No." This was the national test case for the construction of nuclear energy centers. The people of Pennsylvania did not want it.

We must note that in the aftermath of Three Mile Island, this issue has been raised again. Take the plants away from the cities and the densely populated areas and put them in the rural countryside. We would instead urge professional support of a load-center siting. No powerplant should be constructed for people who want the benefits of the electricity, unless we are willing to take the risks and the pollution that accompany that generation.

I think that this is a principle that must be applied in siting policies of generating facilities of all kinds. If a nuclear reactor is not safe enough to be constructed and operated in the heart of a metropolitan area, then it is not safe enough to be sited anywhere else.

Let me turn very quickly to the relationship of Three Mile Island and the actuality of evacuation planning.

Dr. Kepford and I served as the litigants in lieu of legal counsel, we could not afford legal counsel since this committee, along with the NRC, has been refused funds, so we conducted the case in opposition to the licensing of Three Mile Island unit 2 from 1974 onward.

In our cross-examination of the utility, the NRC, the local and State officials on evacuation planning, we found an appalling discrepancy between the promises made and the actuality of preparation that was revealed to be nonexistent 3 years later. There was no clear delineation of the legalized responsibility in the event of radiological emergencies, but we did receive and were given assurances that the preparations were indeed more than adequate to provide for a speedy removal for everyone within a 4.8-mile radius of TMI within hours.

In particular, the governmental officials and utilities were strongly opposed to live drills in which the full population would participate in evacuation drills in anticipation of a possible accident. They felt it would be counterproductive and people would be bored and turned off if they were forced or required or invited to participate in drills that could save their lives.

It became apparent to us that the Director of Civil Defense was so unschooled in the nature of radiation health effects that he could neither define a radiation injury or state the maximum exposure levels to which these volunteer personnel would be allowed to be exposed in the course of their duties during an accident.

Again, I must reemphasize that the NRC has refused to allow discussion of class 9 accidents, accidents as severe as the one that occurred at Three Mile Island. They depend on the redundant safeguard systems that Mr. Boyer spoke so eloquently about earlier.

Another troubling fact that emerged from the TMI-2 record that I would like particularly to bring to your attention; namely, that State and local police already possess the authority to prevent an evacuation as well as to perform it. Ostensibly, this authority would be utilized to speed the removal of the residents closer to the reactor, to get them away before the highways are clogged and jammed. But given the obvious inadequency of available medical facilities or refugee centers to cope with the large number of people in the event of a serious accident, I think we must ask the question: In the aftermath of the near catastrophe at Three Mile Island, is it intended, or will it happen, that this authority to prevent evacuation may be used to detain and cordon off those living in the vicinity of a nuclear reactor if it is determined that they cannot be safely evacuated prior to the arrival of a lethal radioactive plume following a breach of containment accident?

Now this is not a fantasy that prompts this question. Rather, it is the specific wording of a Nuclear Regulatory Commission document which was put into interim use in September 1979. It gives rise to the serious charge that we must make here today:

Namely, the widely publicized NRC and FEMA plans for radiological emergency preparedness and response and evacuation planning all belie the Government's recognition that safe evacuation of populations in the event of a catastrophic radiation release from a nuclear reactor will be impossible. The real intent of these agencies is to be found in the NRC document Nureg-0610. I have attached a copy of that document to my testimony. It is 16 pages long and I would draw your attention quite specifically to Nureg-0610. It was released in September and put into immediate interim use in September 1979. It establishes those four emergency action levels referred to earlier today and they are notification of an unusual event, alert, site emergency, and general emergency.

I would ask you to note that no notification of the press is indicated, of the public and the press is indicated until conditions are serious enough for a site emergency to be declared.

A general emergency, such as the Three Mile Island accident, need not be declared until the release potential exceeds 1,000 curies of I–131 equivalent, as a parenthetical only about 14 or 15 curies of I–131 were believed to have been released at Three Mile Island, or 10 million curies of Xe^{133}. The general emergency class is defined as, "Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity." The first example initiating condition cited on page 1–13 states, "Effluent monitors detect levels corresponding to 1 rem/hr whole body or 5 rem/hr thyroid at the site boundary under actual meteorological conditions."

It is important to note the exact wording of the guidelines themselves on the first page. I would ask that you turn to that page:

> The immediate action for this general emergency class is sheltering, that is staying inside, rather than evacuation until an assessment can be made that (1) an evacuation is indicated and, (2) an evacuation, if indicated, can be completed prior to significant release and transport of radioactive material to the affected areas.

That says to us that there will not even be an evacuation if 1 rem/hr for the whole body are being reported at the site boundary before a general emergency is even declared.

If a very light breeze is blowing at, for example, 4 miles per hour, persons half a mile from the site boundary would have only 7½ minutes to be notified, pack up and leave prior to the arrival of radioactive material.

Further, it is very unlikely that any future class 9 reactor accident will give an evacuation opportunity comparable to the accident at TMI where we had several days before the true crisis naturally became evident and you had to inform many of the people living in the area of the plant.

It is very hard to leave your home on a moment's notice, with an understanding that you may never be able to return. It is very hard even when your life is at stake. Perhaps you who are fortunate enough to live in Washington rather than close to Three Mile Island will have to experience it as we did here in Pennsylvania in order to understand what it means. We now believe that the NRC understands that an evacuation cannot and will not be accomplished. The rulemaking, the criteria, the State and local plans, all of these I say are paper placebos for the public which have on the whole not been able to absorb the terror of TMI that was experienced in the Harrisburg area and much of central Pennsylvania a year ago.

The NRC's Advisory Committee on Reactor Safegurads is apparently not disagreeing that the 20-year-old siting policies reactors had stated and I quote, "Even if the most serious accident possible should occur, the numbers of people killed should not be catastrophic."

The ACRS, Advisory Committee on Reactor Safeguards, goes on to suggest that the NRC can circumvent this siting problem by adopting a document, and I quote, "objectives for acceptable risk both to individuals and society."

We believe that we have seen in the year since the TMI accident began a massive effort by the nuclear industry and the NRC to convince Americans, who now know that nuclear power reactors are dangerous and hazards, that nuclear power is nonetheless essential to economic well-being and, hence, is worth the risk. We are being conditioned to accept moderately severe reactor accidents as acceptable risks along with the NRC to be in power to define the difference between an acceptable death and injury toll and a catastrophic number of deaths that would not be acceptable. More insidiously, is it being proposed that a few rural deaths will be tolerated and the delayed cancers and leukemias from latent, nonfatal injuries to the more distant urban population will be ignored, and these will be the costs of continuing nuclear power.

I would ask the Congress and especially this subcommittee to address themselves far more specifically to preparedness and evacuation issues. We believe it is imperative that the Congress supervise in far greater detail the actions of the regulatory agency in these crucial planning areas because the NRC simply is not doing its job.

Initially, this may not be politically popular. I think the American people have developed a deep sense of unease concerning continued use of nuclear energy. It has been our experience that most people would rather not have to think about it. They do know that the risk is not going to disappear. Voters will, we believe, respond with gratitude to an aggressive congressional reassessment of the national commitment to the use of nuclear power.

What is required is a major revision of those aspects of the Atomic Energy Act that mandate the development of the peaceful uses of nuclear energy. What is also required is a major revision of congressional budgetary allocations of available energy dollars from nuclear to solar, from nuclear to conservation.

A dozen years ago here in Pennsylvania the plowshare program, the other half of the peaceful use of atomic energy, and the people of central Pennsylvania said "No" to the explosion of 1,000 nuclear bombs underground for natural gas. Following that rejection, however, the entire plowshare program's budget simply declined.

The accident at TMI has given the Nation a somber warning about the future of nuclear power that we will ignore at peril of our own and future generations. Budgetary decline for nuclear energy is the next step in preventing the folly of further commitment to nuclear power.

The incapacity of all agencies of government to plan for, much less accomplish, successful evacuation speaks equally to the unacceptable risk of nuclear energy. It would be unwise to allow Limerick to go on line at this stage, particularly because I am very sensitive to radioactive waste issues, particularly unwise to allow yet another reactor to be generating additional quantities of radioactive waste for which we have no possible disposal.

If the complete, safe evacuation of populations at risk from Limerick or any other nuclear powerplant cannot be accomplished, as we must conclude on the basis of a full decade of careful intensive study, then basically the Congress must finally face the inevitable conclusion that nuclear power is not a viable source of electricity and the sooner we switch those dollars to sources that are, the stronger and healthier our economy is going to be.

Mr. KOSTMAYER. Dr. Kepford.

Dr. KEPFORD. I would be thoroughly delighted to be able to sit here and tell you that, as a consequence of the TMI accident, the nuclear industry and the NRC have learned a lot and are able to assure us that the safety level of nuclear powerplants has increased. From my experience in the licensing process of nuclear powerplants over the last 8 or so years, I am forced to conclude that I must think the exact opposite of what is really taking place.

What I must consider really are a series of propaganda statements, public relation statements, and I would like to tell you a little about how the world really works where this business is really put into practice and that is in the licensing procedures because it is the licensing procedures, after all, where all the NRC policies come to whatever change there is to industry's attitude and so on, and I find that troubling in that extreme.

I have listed in my testimony a number of lessons learned, again from my perception. No. 1, that the public cannot be told the truth about emergency preparedness around any nuclear powerplant. I have come up with sort of a rephrasing of that. The NRC found out at TMI-2 that it can get away with permitting reactor accidents.

One subject Mr. Boyer was talking about that I find particularly troubling, it has been discussed quite a bit in recent months, and that is the superventing of gases in the containment structure. That venting will have the possibility of reducing virtually all of the gases within the core in the event of an accident. TMI-2 is somewhere between 140 and 150 million curies. Xe(non)-133, for instance, causes lots of curies of lots of others.

I think that is trouble in the extreme, especially when that concept is tied in with Nureg-0610, which seeks to delay as long as possible any notification of the public that anything is going wrong with a nuclear powerplant.

The troubling aspect I find when we deal with emergency planning, we saw it through our emergency planning contention which is appended to my testimony, to investigate various assumptions, to litigate them behind the entire concept of emergency planning. The licensing board struck every contention from that proceeding because they were assumptions and they did not want assumptions discussed. I find that very troubling.

The NRC, through its licensing board, also cleansed, as it were, our petition because we sought to litigate the various timeframes through which serious accidents might unfold, some like TMI-2 that appear to unfold very slowly. But I do not think that is really so.

Again, at 4 a.m. Wednesday by the middle of the afternoon, it was releasing radioactive gases at a rate such that they were coming out a few dozen times more in 1 hour than the plan should have been emitting in a year.

According to a report done by a Met Ed contractor, Pickard, Lowe, and Garrick, the release rate is estimated at 3 p.m. Wednesday to be around 280,000 curies per hour. It peaked around midnight with a release of about 650,000 curies per hour. If there was going to be evacuation planning, it should have been underway at that point.

I might add that while those time release rates were going on, the wind was blowing largely from the south, southeast, and the east southeast. In other words, in the general direction of the nearest large population center, which is Harrisburg.

The hydrogen bubble brought the real evacuation scare. Even then, there was no apparent ability to pull it off, and this struck me as strange because I remember very distinctly that I carried out a few days of cross examining the State, local, and NRC witnesses concerning evacuation, emergency preparedness and so on and I must say that from my transcript, it is filled with assurances that everything will take place exactly as planned and there cannot be any serious problem. And yet when the accident came along, there were indeed some serious problems.

And the same thing is true when it comes to the providing of accurate and factual and timely information to the public. Again, the TMI-1 Restart Board eliminated all references to any necessity to providing that kind of information to the public. This leads me to believe that the door is then open for the NRC and whoever telling anything to the public which involves an accident. They can tell anything they want so as to preserve order, preserve the public relations interests of the utility or whatever. But really what we are interested in is protecting the health and safety of the public and there is no requirement for honest, factual, or timely information to the public. It is at an extreme disadvantage. Here again at the TMI-1, Restart Licensing Board is covering for the NRC and the industry. The protectionist and promotional attitudes of the NRC staff can continue indefinitely as a result of the TMI-2 accident.

Mr. Denton's testimony this morning to me typifies that, but again, when the licensing decision comes down, to me it is simply conceivable. No matter what the record states, no matter what evidence is presented, no matter what the imbalance is, the license is going to be granted anyway by the NRC.

The main lessons, in my opinion, of the review groups, and I quoted some of the testimony, are that it is the attitudes of the individuals in the NRC. The NRC underwent a splitting a few years ago, as I am sure you are aware. The Atomic Energy Commission was split and the NRC [inaudible] were incorporated into the rules. Laws were changed, but the attitudes of the people certainly did not.

One of the findings of the Kemeny Commission Report, and I quote, "With its present organization, staff, and attitudes, the NRC is unable to fulfill its responsibility for providing an acceptable level of safety for nuclear powerplants." With all the hand waving and all the planning and all the quick fixes for nuclear powerplants that could be applied will not change the attitudes of the regulators and those attitudes remain unchanged.

The most struggling aspects I find in the licensing proceedings is that the NRC is moving in the direction of totally cutting off information from litigants. The NRC staff is being freed of any obligation whatsoever to supply documents and the process of discovery and members of the committee, those of you who are lawyers know how important discovery is in litigation.

The NRC staff now, even though it promised to supply discovery information, is not being held at all to its word to supply such information. In fact, in the TMI-1 restart proceedings, the vast majority of all information having to do with the TMI accident and under the careful watch of the licensing board, the NRC did not forward one single piece of paper yet pertaining to the TMI-2 accident. That is the attitude which I find troubling.

On the other hand, the licensing board will sit back and watch while staff and utilities ask hundreds, even thousands, of interrogatories of the interveners and tie them up all waking hours for months answering interrogatories at the whim of the NRC staff and the applicant. When you are all through answering them, you get them back saying that the answers are evasive, unresponsive, and inadequate and must be reanswered. So you go through the process again. But that is what is happening nowadays in the reactor licensing.

We heard quite a bit of talk about the topic of core meltdowns. I submit if we learned anything at all from the TMI-2 accident, we should know by now that any talk of containing a core meltdown is a sure fantasy. One of the reasons for the quick venting of krypton gas is because at TMI-2's, pipe seals, vent seals and so on are being degraded by the action of radioactive materials.

Well, considering the quantities of radioactive materials released at the TMI-2 containment structure and how much larger they would be in the new equipment, I submit if they are having trouble with the seals for TMI-2 now, forget it when it comes to a core meltdown because seals will go much, much faster and the radiation levels will be much higher and you will have essentially 100-percent release of all radioactive materials to the containment structure.

Last, when the next serious accident happens, you will learn about it after the fact. Personally, I have been very, very troubled by what I consider the manipulation of the monitoring and health effects data by virtually all of the official reviews of that data. I refer to the report of the Ad Hoc Population Dose Assessment Group, both the Kemeny Commission and the NRC-SIG Commissions, reviews and so on. They all suffer from very serious defects.

All discussions assume the response of an exposed population is uniform. Yet it is known that the response of individuals to radiation varies, since the human species is not a homogeneous, but rather a heterogeneous mixture. Health effects—meaning cancers—calculations are based on inappropriate standards and inappropriate studies. The results of the studies of the atomic bomb victims bear no demonstrable applicability to relatively low dose and low dose-rate exposures from normal plant operation, yet this is where we get our radiation standards.

Last, none of the studies of exposures from the accident have considered the quality of the available monitoring data, the sparseness of the data, the reliability of the data, and the applicability and accuracy of the meteorological models used in the computations. In short, none of the studies has yet revealed any complete sensitivity analyses of the complete methodology or expressed a full and complete set of confidence limits on the exposures estimated.

Dr. Sternglass has suggested that there has been a significant increase in infant mortality in the Harrisburg area, in Pennsylvania, in Pennsylvania itself and in the Northeast as a result of the accident. In its rebuttal of Dr. Sternglass' allegations, the Pennsylvania Health Department is going to rather extraordinary lengths to manipulate its data to refute him. The Pennsylvania Health Department has drawn a 10-mile radius circle around TMI-2 and compared the infant mortality as not so different than other areas.

When the release rate was classed, the wind was blowing in the direction from TMI-2 to Harrisburg. So the exclusion of Harrisburg is not founded in sound cited principles.

Second, the health department excluded Harrisburg since Harrisburg has a large black population and since blacks in the United States have a higher infant mortality rate than do whites. That is also bunk, because Sternglass used infant mortality data from the month immediately before the accident and compared it to months immediately after the accident and found an increase after the accident and any effect of the black population would have simply been subtracted out unless, of course, there was a large influx into Harrisburg of pregnant black women immediately after the accident.

It should be noted that the controversy over the health effects of the TMI-2 accident and for that matter, of the health effects of the normal operation of all nuclear powerplants, is due in large part to the continuing refusal of the NRC to ever do a base-line study of population prior to the operation of a nuclear facility. The absence of this data, along with the relatively primitive level of health data gathering capabilities in most States, denies epidemiologists the information they need to honestly and scientifically settle this controversy.

It does appear to this individual that the NRC and the nuclear industry have adopted from the Vietnam war what can only be referred to as a body count mentality. By this I mean that unless some member of the public can gather together at one time enough dead bodies which can unequivocally be related to some nuclear mishap, the NRC and the industry will forever issue blanket denials of any causal relationship between nuclear powerplants and subsequent casualties.

At the present time, nuclear power generates only about 13 percent of our Nation's electricity. There is no better time than the present to pause to have a thorough review of the nuclear energy program, prior to any increased dependence on this inherently hazardous method of boiling water. We do not have, after all, any other source of boiling water which has so many unsolved problems. Nor do we have any other method of boiling water which entails the largely unknown risks to the present and all future societies as nuclear power. Nor do we have any other methods of boiling water which have had the backing of virtually the entire infrastructure of industry, academia and, of course, Government, or which have been funded so completely by tax money.

Yet the industry still demands subsidiaries, such as tax credits, to build more unneeded facilities; tax-financed-away-from-reactor storage facilities and waste disposal facilities; future repair work on mill tailings to be disposed of; and, of course, all of the obvious and not-so-obvious subsidiaries associated with the Price-Anderson Act.

Both the Kemeny Commission and the Nuclear Regulatory Commission and the special inquiry group issued calls and warnings to the Congress to exercise the lawful congressional oversight over the NRC and the industry. I can only repeat these calls. It is time the Congress demanded high levels of performance from the NRC and industry. It is time Congress acted to protect the health and safety of the public since the NRC continues to fail to do so. It is also time the Congress removed from the Atomic Energy Act of 1954, as amended, all language which can be construed as requiring the U.S. Government to promote the use of nuclear power here and abroad.

The present system, after all, cannot be self-correcting. Rather, like any and all bureaucracies, it can only be self-protecting.

As some wise man reputedly said, "War is too important to be left to the Generals." If indeed war is too important to be entrusted solely to those whose lives are dedicated to the study and practice of war, it may also be reasonably expected that nuclear power is too important to be left to those who lives have been dedicated to the belief that nuclear power is safe and necessary.

Thank you.

Mr. **Kostmayer.** Thank you very much for your testimony.

Mr. Glickman is recognized.

Mr. **Glickman.** I appreciate your testimony very much. I wanted to let you know that I, for one, am frankly in support of intervenor funding for the Nuclear Regulatory Commission as I am for all Federal regulatory agencies within reason. We will do what we can, but we have had some problems in the Congress and in the House in particular with that issue.

Dr. **Johnsrud.** We know that.

Dr. **Kepford.** I would like to make one point. Most of the intervenor funding proposals discussed before Congress have been such that the intervenor would have to get down on his hands and knees before the NRC itself to get any funding and normally it would be after the fact funding proposal. I think both of those aspects deserve quite a bit of questioning. I do not think the NRC is the appropriate agency to be judging whether or not the intervenor is worthy of funding.

Mr. **Glickman.** Let me tell you that Congress is presently authorizing a bill dealing with regulatory reform which would change the method by which all agencies issue rules and licenses. In that bill, we propose that it will not be the agencies providing either the funding or the choice of people. It would be the Administrative Conference of the United States which basically runs the administrative bodies of Government. So it would be separate from the agencies themselves. I do not know if that is going to pass into law or not, but what we are trying to do is to make more independent the process of choosing who will actually be participants using the intervenor funding.

Dr. KEPFORD. I think that is appropriate.

Dr. JOHNSRUD. I would hope that such a proposal would not exclude the kind of individual who arises in the nuclear issues and engages in litigation. In the Three Mile Island Unit 1 restart proceedings, there are individuals who have no backing whatsoever, who have no funding sources other than their own salaries or maybe they gave up their jobs to participate. Yet, those individuals, just as Dr. Kepford did in the radon issue, are raising matters of utmost importance such as agriculture evacuation and so on.

The idea of those groups who are participants of the intervenor funding, primarily the Federal Trade Commission, are Washington-based groups. So it is the same ones all the time and our idea is to try to decentralize that so we have different groups of people eligible for that.

Mr. GLICKMAN. I have to leave, but I thought I would make a couple comments before I go. I have to catch a plane back to Washington.

In the first place, I want to tell you that these hearings have been very enlightening for me. I come away convinced that this Government has not crystalized an evacuation policy that is worthy of it in terms of future operation of this industry, whichever way it goes.

I will always continue to be troubled by this nuclear question. It is almost identical all over the country. One person gives a statement and the same 65-percent clap and then we have the nuclear energy people up here and the same 35 percent of people give their applause. It gets me like we have a war, a game here, and it is between sometimes I feel—and I am overstating it a bit—the arrogant nuclear power industry versus the true believers of the antinuclear. And in the midst you have an incompetent Federal bureaucracy and a Congress that is not doing enough oversight in the process.

In the midst of all of this, as I said before, I come somewhere in between, I do think there is a place for nuclear power. But I think we have to be not afraid to tackle some of these problems such as evacuation and the like.

What also confuses me all the more is the scientific and economic analysis. It is like I am talking to two different worlds when I talk to the pros and the cons. Therefore, it makes public policy very difficult to make because when one side says nuclear power is inherently dangerous and often it is the same group of people who say coal is also inherently dangerous and there is only one source of energy and that is solar today. Then you take the other side and it says that nuclear power is inherently safe and there is absolutely nothing wrong with it and the intensity factor becomes so great that in the process, I think there is a tendency to lose a lot of objectivity.

We know this Nation has a serious, serious energy shortage. We are hemorrhaging to death in the form of an outflow of dollars. I know that unless we find alternative sources, my children are not going to be able to have the kind of lifestyle that I did and their freedom may suffer accordingly.

What we are trying to do is find the best mix, the best balance under the safest possible conditions. If we have to err, we err on the side of safety. I agree with Dr. Kepford and that is now is the time to pause for thorough review of all the issues we are debating here.

I would have to say it has been an enriching experience for me. I see that the people of southeastern Pennsylvania appear to be as gregarious as my constituents in Kansas, if not more so, and I am just delighted that I had an opportunity to be here today to talk with you.

Dr. **Johnsrud.** I am involved in radioactive waste reassessment of confidence proceedings before the NRC. I have to say, there is a problem with reaching consensus on what to do with matters such as radioactive waste, so long as the problem continues to be allowed to expand, so long as the production of that waste continues while there is no solution in sight. Now there are some good possibilities perhaps out in the wings in back of some research labs, but there is nothing here. There is nothing noplace, nohow to take the waste of Three Mile Island.

Mr. **Glickman.** What do I say to the French or West Germans when they see all this equipment here who say you are crazy, why are we going to need a reactor when you would not be creating waste. Well, they do. I have had people from all over Western Europe come into my office and say, you and America are going to be left behind because we are going to go through the technology of creating waste.

Dr. **Kepford.** In my mind, it is the height of scientific dishonesty to try to rely on an unproven concept when we have not solved the problems of the light-water reactor yet. Greater technology requires fuel reprocessing, which fuel is much hotter than comes out of the reactor. A very, very short time period, a matter of days, before it goes into the reprocessing plant and the workers get a higher level of radiation exposure. If the French reprocessing plant is any indication, radioactive remissions will be sky-high. We still have the unsolved problem of how to prevent plutonium from slipping out through the cracks in the floors and so on.

All this talk about breeders is really nice except when you start looking at the doubling times, for instance, the French breeder reactor, 50 to 60 years to double your inventory of fuel, forget it.

Mr. **Glickman.** I would just like to close by saying one thing. It is true that through the good offices of your Congressman, Mr. Kostmayer, I have become interested in this subject and I think the people in this room ought to have gratitude for him.

Mr. **Kostmayer.** Thank you very much.

I recognize the gentleman from Massachusetts, Mr. Markey.

Mr. **Markey.** Thank you, Mr. Kostmayer. I too want to offer some reflections on this hearing before I have to leave for a plane. I know a lot of people also want to be able to speak publicly and the fact that I am amply familiar with the positions, I would like to make a statement that is somewhat an echo of what Congressman Glickman said. My position is quite clear on it.

I do think these forums serve an important opportunity to have both sides of the issue be able to hear the colloquy and considerations in the public policy area, and that the people have the chance to come to these kinds of forums to present their views to the other side, no matter how long they might be, to express those points of view one way or the other.

I learned something here today. I have been exposed to a number of concepts that I had not heretofore had the opportunity to be presented. I think that is healthy and I think it is good. I think that oftentimes when you are down in Washington, you do lose contact with the people you are supposed to be representing back home. I am suppposed to be the eyes, ears, and voice of the people back home, but sometimes you forget where you come from. Again, I think Congressman Kostmayer should be complimented on this because this is a rare, if not unique occasion. It is very rarely that we bring congressional hearings to the people.

So I compliment you again, Congressman. I have been to Pennsylcania several times in Harrisburg and I expect that I probably will be returning again. I thank you very much for your hospitality.

Mr. **Kostmayer.** Thank you. The gentleman from Nebraska is recognized.

Mr. **Cavanaugh.** Thank you, Mr. Kostmayer, and I would also indicate that I am leaving at the closing of my questioning. I have had the pleasure of bringing my entire family to Bucks County and spending a couple of days here and it is almost as beautiful as Nebraska. I have enjoyed the hospitality of Representative Kostmayer and I have certainly benefited from the experience today.

I do have a couple of questions for the witnesses in that the primary focus of the hearing today was an evaluation of emergency planning in connection with the Limerick facility.

I take it from both of your testimonies that you agree with Mr. Boyer that emergency planning is basically window dressing and that the essence of the issue is the structural design and securities of the facilities themselves; would that be a correct interpretation?

Dr. **Johnsrud.** Yes and no insofar as I am concerned. Mr. Boyer's supplement agrees with us. I think in this instance it is very clear that evacuation of a metropolitan area and particularly the physical conditions of this area, the road conditions, the rivers and streams and so on, would be absolutely impossible. Certainly no major city can be evacuated. I think that is clear to everyone who has thought thoughtfully about the matter.

However, I think perhaps this is the most important thing to be said today. There are two ways of approaching human beings and their machines. One is with the arrogance and assurance that one is capable of knowing and solving all problems. The other is with human humility and recognition of one's own fallibility and when indeed the potential for a breach of containment accident from any possibility, all unevaluated, is there, then I say that we must take the humble approach to our knowledge.

I do not believe that the nuts and bolts of design, construction, fabrication of equipment, inspection, enforcement, repair, operation can ever be good enough to give an adequate level of assurance of nuclear safety.

Dr. **Kepford.** If it is all right, I would like to respond, too. It is not every day that Mr. Boyer and I agree on things, but as far as the window dressing aspect of evacuation planning, I think it is. One thing I found somewhat troubling was he read so much of his statement, it seemed to me I heard so much of it before. I found out where

I heard it was Jack Herbein's testimony on TMI-2. The meanings were the same, all the same regulations, nothing bad can happen and if an accident does happen, everyone is going to rush out with their Geiger counters and know exactly what the radiation levels are and if it calls for an evacuation to take place, there will be no problem.

I would have hoped we would have learned something in the last year or so.

Mr. CAVANAUGH. But on the issue of evacuation and emergency planning, you then would feel that those efforts are basically superfluous and that preoccupation of either the Congress or the NRC for the injection of emergency and evacuation planning procedures into the licensing procedure are irrelevant?

Dr. KEPFORD. No, I do not think so at all. I think what is most important in my mind is to guarantee each and every member of the public the right to say "no" to unwanted radiation exposure and if that means radiation from a nuclear powerplant accident, I think that has to be considered.

What the Federal Government is moving toward is a set of guidelines which crank up members of the public fairly high radiation doses, exposures, before they are even notified that something is going wrong. At that point, once the public realizes that something is going wrong and the people in the small radius might start to be evacuated, I would really think that after the TMI-2 accident there would be wholesale panic. And that is what bothers me.

Mr. CAVANAUGH. Well, is that not the purpose of emergency planning, to avoid a panic and provide for orderly procedures in the event of an emergency?

Dr. KEPFORD. Sure, if you are going to prepare for orderly procedures. But the way the NRC is moving and certainly the way the licensing board is moving, they are moving in the direction of a very hush hush kind of situation until everything is in place.

Mr. CAVANAUGH. I am not sure I understand you.

Dr. KEPFORD. The infrastructure for evacuation will be set up. Whether or not it works with a public that has been delayed, where there has been a considerable delay in getting the information to the public that there might be an evacuation, I simply do not know what the response of the public would be.

Mr. CAVANAUGH. Is that not one of the suggested emergency procedures, to provide immediate notification of the public?

Dr. KEPFORD. No. If you look at NuREG-0610, it is only after a site emergency has been declared that notification is mandated. Only then, not at the first sign of trouble.

Mr. CAVANAUGH. When do you suggest that the notification should occur?

Dr. KEPFORD. I think it would be far better if the utility would swallow their pride a little bit and be up front about problems and tell them in a timely and accurate fashion.

Mr. CAVANAUGH. That would not be my understanding that anyone would disagree with that.

Dr. KEPFORD. That is one thing the NRC will not let us litigate in the TMI-1 restart hearing and that is what organization is going to provide such information. The NRC will not let us litigate this.

Dr. Johnsrud. Perhaps these are matters which your committee will be able to address. There are some nuclear powerplants that maybe for some period of time longer are going to be needed in some few areas, although I would note to you of the 72 reactors that are licensed to operate throughout the latter part of 1979 and into 1980, we have seen a steady decline in the numbers that are actually operating. In April, 22 of the 72 licensed plants produced no electricity at all. This has been the pattern that has occurred as the problems multiply.

Now perhaps partly what is needed is a congressional look at the degrading of plants. We are down to perhaps 8 percent or even less of our electricity supply from nuclear powerplants. Certainly during this period of reevaluation, that is an amount that can be recovered by alternatives and we certainly urge this as a policy of wisdom given the multitude of uncertainties, the lack of responsiveness of the NRC and certainly shown today of some of these utilities.

Mr. Cavanaugh. I understand your animosity toward nuclear power as a source of energy for the country, but I am trying to direct my questions at the parameters of the hearing here today, which were inclusion of emergency procedures in the licensing process.

Now assuming that we are going to have a licensing process and the licensing process is going to continue, which may be a presumption that you prefer to contest, but that is the reality that exists today. My question is, is it meaningful, is it important, is it significant or is it irrelevant that we include in that licensing process emergency evacuation plans?

Dr. Johnsrud. For the Atomic Energy Act to be fulfilled, for the NRC to obey the law, the protection of the health and safety of the public must be considered in the licensing process. If a utility and the agencies of Government are incapable of providing for safe evacuation and have been able to demonstrate and assure, not in the manner that has been done in the past, but truly sure, then no license should be issued.

Mr. Cavanaugh, the utilities are engaging in risk capital when they decide to build a nuclear powerplant. There is no guarantee that they have to receive a license if they cannot protect the public and that becomes part of what [Rest of sentence drowned out by audience.]

Mr. Cavanaugh. I understand that. I asked my question twice and I——

Dr. Johnsrud. The answer is "yes," we think this must be fully examined with the assumptions that underlie evacuation and emergency preparedness, also being open to full, fair litigation.

Mr. Cavanaugh. Then your answer to my question rather than your own propounding question is "yes" you do think that the licensing procedure should entail an evaluation of emergency evacuation plans?

Dr. Johnsrud. If the law is to be there, yes, sir.

Mr. Kostmayer. Thank you.

[Hearing concluded at 5 p.m.]

APPENDIX

Additional Material Submitted for the Hearing Record

NINETY-SIXTH CONGRESS
MORRIS K. UDALL, ARIZ., CHAIRMAN

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, D.C. 20515

CHARLES CONKLIN
STAFF DIRECTOR

STANLEY SCOVILLE
ASSOCIATE STAFF DIRECTOR AND COUNSEL

LEE MC ELVAIN
GENERAL COUNSEL

GARY G. ELLSWORTH
MINORITY COUNSEL

May 27, 1980

MEMORANDUM

To: Morris K. Udall, Chairman, Subcommittee on Energy and the Environment

From: Peter H. Kostmayer, Member, Subcommittee on Energy and the Environment, and Acting Chairman for the Subcommittee Oversight Hearing on the Limerick Atomic Power Station

Re: Summary of Comments from Concerned Citizens Regarding the Limerick Nuclear Plant

Attached for inclusion in the Subcommittee's hearing record on the Limerick nuclear power plant is a summary of comments from citizens who live in the vicinity of the Limerick site. Also, I have attached copies of written statements representing the diverse views of many of those concerned citizens who attended the Subcommittee's field hearing. As you can see, the issues raised because of the Limerick project are of intense interest to my constituents.

SUMMARY OF COMMENTS FROM CONCERNED CITIZENS REGARDING THE LIMERICK NUCLEAR PLANT

Immediately following the Subcommittee's oversight hearing, witnesses from the general public were invited to submit testimony and make statements regarding the Limerick nuclear power plant. Mr. Kostmayer invited all of those who wished to testify to make an oral presentation of approximately five minutes, and to submit their written testimony for the record. Complete copies of all submitted testimony will be on file in the Committee's offices. Appended to this memorandum are selected statements which are printed in order to portray the broad range of views presented by the witnesses from the general public.

Of the 25 witnesses who testified in person, and the 11 aditional statements which were submitted for the record following the hearing, the overwhelming majority were opposed to the completion of the Limerick nuclear power plant. These witnesses raised a variety of issues, but the two most frequently mentioned were those dealing with the implications of safety and emergency planning of the plant location, and questions concerning the balance between safety and economics. In this respect, the testimony followed the major lines of inquiry pursued by the Subcommittee in its questioning of official witnesses previously.

These basic issues were discussed in the statement by Mr. Allan J. Nogee of the Keystone Alliance who stated "we are outraged that nuclear power plants, which we consider dangerous and unnecessary in any case, could be built in our urban back yard. Limerick is often referred to as the second or third most densely populated nuclear site in the U.S. In fact, it will be worst ... Limerick is a perfect example of where safety and economic factors must be considered together. For whatever position one takes on the advisability of shutting down already operating plants, what rationale can there be for completing a plant which is unsafe and unnecessary ...?"

One witness shared the view of Philadelphia Electric officials that an evacuation plan is not necessary solely because of the proximity of a nuclear power plant to large population centers. Conrad G. Bacon cited the use of reactors on board nuclear aircraft carriers with a crew of about 3,520 men living on the carrier, with no plan for evacuation.

Despite this optimistic attitude toward the safety of nuclear reactors, when talking about the large numbers of people surrounding Limerick, public attitude at the hearing strongly favored a mandatory evacuation plan. According to Mr. Alan S. Fintz of Philadelphia, "It would be a violation of the due process rights of the local citizenry to subject them to the foreseeable dangers of nuclear mishaps without planning to allow them to secure their lives and property from nuclear hazards."

However, some witness questioned whether or not evacuation planning was feasible. Mr. Nogee and others stated that there would be a problem because the major transportation route, U.S. Route 422, could not handle the crowds that would flow out of the area. Nogee is concerned by the fact "we couldn't squeeze 10,000 people into Limerick along the only major access/exit route -- U.S. 422. How could that road evacuate the more than 400,000 people who will live within 10 miles of Limerick in the middle of its proposed lifetime?"

In addition to the sheer numbers of people, evacuation may also be hampered because of the characteristics of the surrounding community, according to the testimony presented. The Borough of Norristown is one of the communities close to Limerick that might have to be evacuated in event of a nuclear emergency. According to the Chief Executive Officer of the borough, Mr. John Plonski, Norristown has many elderly people, many who live in apartments and rowhouses, and many that rely solely on public transportation. Norristown also contains a prison, two hospitals, nursing homes and "halfway houses." Mr. Plonski stated that, under current conditions with no federally approved plan for evacuation on any level, his community is in serious danger should there be an accident, and that " ... we are not able to address ourselves to what could be the greatest challenge of all -- the efficient and safe evacuation of our community in case of major catastrophe."

One witness, Marcia J. Ehrhart of Harleysville, critiqued the idea that emergency sheltering could take the place of evacuation planning as a response to a nuclear accident. She stated,"Being placed in a shelter should not be considered adequate. While it is clear that 'shelters' are based on the idea of providing temporary, short-term safety, it cannot be assumed that a nuclear disaster would be short-term."

Although the evacuation issue was of paramount concern to most of the witnesses who submitted testimony, other safety-related factors were mentioned. For example, Mr. Marvin Lewis pointed to the potential problem with the concrete construction of Limerick as a result of dynamiting taking place at a quarry next to the plant site. His concern centers on the fact that "green" or uncured concrete weakens when finished if it is vibrated. Mr. Lewis stated that the NRC never attempted to discover if the blasting did indeed occur near this "green" concrete.

Further uncertainties over site location were underlined by Mr. Frank R. Romano, Chairman, Air and Water Pollution Patrol, in Broad Axe, Pennsylvania. Mr. Romano was worried by reports of three earthquake faults -- all within one-half mile of Limerick -- that may become active within the plant's lifetime. He added, "Limerick has three faults that could ... suddenly wake up ... in fact, the dynamiting and the vertical cracks almost guarantee it."

Ms. Phyliss Zitzer, a member of Limerick Ecology Action, pointed to another possible problem which remains a controversial issue in the plans to complete the Limerick plant. This concerns the plant's ability to draw on adequate water supplies. Ms. Zitzer maintains that the Atomic Energy Commission's job of determining alternative plant sites was not sufficient and, as a result, there would be problems (such as limited power during dry spells) once the plant begins operation. Ms. Zitzer stated "failure to properly consider environmental impacts and alternative sites before significant financial commitment was made at Limerick has made a mockery of the regulatory process ... It has always been our contention that the water supply at Limerick has been inadequate for the proposed nuclear facility."

The second key issue discussed in the public witness portion of the hearing centered on economic considerations and energy efficient alternatives to Limerick. When debating the necessity of the Limerick plant, many witnesses stated that a connection between safety and economic growth has to be made. While everybody allows that investments in local energy projects mean jobs for local citizens, it is arguable whether the construction and maintenance of a nuclear power plant is the only route to take for adding people to the labor force.

On the other hand, Mr. William R. Taylor, Director of Labor and Industry for Energy Jobs (LIFE Jobs) was satisfied that the added safety features of the plant, including an improved communications system, would adequately protect the surrounding population while also leading the way toward more jobs. He stated, "Energy is the key to providing not only jobs for Pennsylvanians, but also to hopefully increase the standard of living for many of our disadvantaged citizens. There is still the American dream of being able to better one's station in life and that can't be done without jobs and energy."

Most witnesses agreed with the general statement that Pennsylvania does need more industry to boost its slumping labor market, but thought that more energy-efficient and safer strategies could be developed to provide the needed employment opportunities. Mr. Marc Breslow of the Mid-Atlantic Antinuclear Coalition stated, "... we have a crisis of energy priorities." The Coalition maintained that utilities should invest in safer energy sources, such as solar and conservation technologies. These latter sources could include the conversion of factory waste heat to energy and the enforcement of a flat rate per kilowatt of energy use by industry.

Mr. Marvin Lewis, another proponent of substituting alternative energy sources for nuclear power, described the technical advantages of employing conservation techniques by saying, "House insulation can be installed with a stapler."

The call for an emphasis on safety was reiterated by Mr. Nogee of the Keystone Alliance. Mr. Nogee suggested that the construction of Limerick ought to be halted until independent studies are conducted to determine the practicality of wind, solar, and coal as energy options. By having non-nuclear power sources, Nogee contended the health and environmental interest of the public would be more adequately met.

Another key economic question centered around the need for a nuclear power plant from the perspective of public demand for energy. Mr. Taylor of LIFE/JOBS stated that the electricity generated by Limerick will reduce the amount generated by oil, so in actuality, the oil fueled units would not be used unless needed. On the other hand Mr. Breslow noted that electricity demand fell from a 7 percent annual growth rate in the late 1960's and early 1970's (when Limerick was originally planned) to a 1 to 2 percent annual rate today. Therefore, he stated, there is no need for having the plant built in view of the excess capacity that would result from completing the plant.

Attachment #1 to Kostmayer Memo

Statement by Robert H. Taylor, Lumberville, Pa. 18933

I happen to live where unexpected occurrences involving a nuclear plant at Limerick could have serious personal consequences. My concern focuses on two points: accidents, of which Three Mile Island has been a prime example, and non-accidental occurrences or situations.

Regarding the first point, or the matter of accidental occurrences, I would call attention to prominent front-page stories appearing on March 15 in the local press to the effect that the Nuclear Regulatory Commission had been discussing the desirability of requiring fallout shelters in the vicinity of the Limerick nuclear plant-- shelters to accomodate many tens of thousands of people. When I read this, I was astounded.

My first question is whether such discussions have in fact taken place. If they have not, I would have expected some kind of correction by the press. If such discussions have taken place, I am surprised that the significance has not been brought home more forcefully to the public.

Assuming that such discussions have taken place, I am left with only two interpretations. First, they may have been carried on in jest. Personally, I don't regard this as a joking matter, especially on the front pages of respected newspapers. If they were not joking, but were discussing this in all seriousness, it may be that they did not expect the fact to become public. This could help to explain why further discussion of the subject has not been encouraged.

Very pertinent to this matter is the fact that with an enormous military defense budget, with untold billions of dollars committed to protect our people against nuclear attack, the threat has not been taken seriously enough to maintain more than a feeble token of fallout shelters. Does this imply that the authorities regard the possibility of a serious nuclear power plant accident as more of a threat than a nuclear attack? Certainly this matter deserves more public discussion.

An indication of just how real the threat of disastrous accident appears is the refusal of the insurance industry to consider underwriting 100% liability coverage on nuclear plants. It is no answer to say that the Price-Anderson Act relieves them of the responsibility for this. It means only that the Act deserves careful scrutiny when it comes up for renewal in the not too distant future.

On the second point, the matter of non-accidental occurrences or situations, there are two aspects. One is planned or expected situations. These may be regarded as having certain recognized disadvantages or costs, either financial or social, but they are

best copy available

tolerated, in the planning stages, as being outweighed by advantages. An example in the case of the Limerick plant is the proposal to draw heavily from the Delaware River for cooling water, by means of a pumping station which would be located at Point Pleasant. I am very familiar with the river in that area. I personally am strongly opposed to such a plan, but will leave it to others to present detailed reasons for such a position.

Another example of planned situations (or those deliberately entered into with incomplete planning) is the method of handling nuclear waste. Will spent fuel be reprocessed, or will it simply be kept indefinitely on the plant premises, steadily building up a lethal glut of disastrous proportions? We should get firm and acceptable answers to these questions before proceeding.

The second aspect of the matter of non-accidental occurrences deals with the vulnerability of nuclear plants in general, and Limerick in particular, to deliberate actions of malevolent individuals or groups. Whether considered in terms of sabotage or of nuclear wepons proliferation, I believe it will come to be a far more serious threat than the problem of accidents, which until recently has appeared to be almost the sole preoccupation of industry experts concerned with safety.

Although these things apply to nuclear plants in general, there is a special problem at Limerick because of the high population density. Another special thing about Limerick is that its approval for completion as a nuclear operation, after intensive study by such agencies as this Subcommittee, could well be interpreted as a green light for the industry generally. There is no way, in my opinion, that open-ended expansion could avoid leading to some disaster of monumental proportions. It would not be a question of whether, but rather of when.

And it may already be too late.

Robert H. Taylor

Attachment #2 to Kostmayer Memo

LIFE/JOBS
Labor and Industry for Energy and Jobs
Suite L-6 • 130 S. Third Street • Harrisburg, PA 17101
WILLIAM R. TAYLOR
Executive Director
Phone (717) 232-2461

LIFE/JOBS STATEMENT
CONGRESSIONAL HEARING
BUCKS COUNTY COMMUNITY COLLEGE
NEWTOWN, PENNSYLVANIA

May 27, 1980

I am William R. Taylor, Exec. Dir. of Pennsylvania LIFE/JOBS - Labor and Industry For Energy Jobs.

Our organization is unique in that our membership consists of labor unions, industries, associations, partnerships, and individuals united with the goal of adequate energy and continued employment for the people of the Commonwealth of Pennsylvania.

Although we are only four years old we already have a membership of 100 unions, companies, associations, etc., and are in the process of expanding.

LIFE/JOBS is here today to strongly object to any change in the construction plans at the Limerick Generating Station, EXCEPT we do support the speeding up of construction as suggested in the recently completed management audit of Philadelphia Electric Company. This impartial audit was done by a consulting firm hired by the Pennsylvania Public Utility Commission (PUC) and concluded the consumer would benefit if construction were accelerated by two years.

Everyone knows there was an accident at Three Mile Island (TMI) over a year ago. That incident has been studied ad infinitum - the causes determined, reports issued, and changes made. The bottom line is that nuclear power is a safe, economical method of generating electricity now and into the next century.

President
THOMAS H. MILLER
Pa. State Bldg. Trades Council
Suite 403, 301 Chestnut St.
Harrisburg, PA 17101
(717) [illegible]

First Vice-Pres.
ROBERT McINTYRE
Pa. AFL-CIO
101 Pine St.
Harrisburg, PA 17101
(717) [illegible]

Second Vice-Pres.
JOHN PAULDING
UGI Corporation
1250 Paxton St.
Harrisburg, PA 17103
(717) [illegible]

Secretary
FRANK MONTGOMERY
Pa. Electric Ass'n.
800 No. Third St.
Harrisburg, PA 17102
(717) [illegible]

Treasurer
ANDREW B. JOHNSON
I.B.E.W. International
30 Midway Road
Pittsburgh, PA 15216
(412) [illegible]

Too often elected officials tend to give undue importance to small numbers of vocal supporters of various issues. The squeaky wheel theory! Well when you begin to adversly affect employment and the energy supply, a new vocal group develops - labor and industry speaking with one voice. It is assumed that these two are natural rivals but that is not true. They are natural allies because there are no jobs without industry and without workers there is no industry.

Energy is the key to providing not only jobs for Pennsylvania but also to hopefully increase the standard of living for many of our disadvantaged citizens. There is still the American Dream of being able to better one's station in life and that can't be done without jobs and energy.

In checking with Philadelphia Electric Company and Bechtel Power Corporation there is no indication that the chairman of today's meeting or any members of his committee have visited the site in question. LIFE/JOBS would be pleased to make arrangements for such a tour so the committee, labor, and industry representatives can see first hand the construction. You will be able to observe the skill and dedication of the members of the building trades. When the plant is completed much of their detailed work is unnoticed. Such a trip would also allow you to learn of the many additional safety features (planned before TMI) that are being incorporated in the plant because of the higher density of population than at some other plants.

Following TMI, the nuclear power industry and electric utilities responded immediately in assessing the causes and determining how to insure such an occurrence would not happen again. A great deal of importance was given to the technical changes, equipment improvement and operator training, but perhaps the worst failure of TMI was in the area of communications. This caused most of the psychological stress and needless worry as determined laterby the many investigations. A generic industry guideline was developed to be used by utilities to improve their communications not only in emergencies, but also during routine operations and maintenance work that causes a change in status at an operating nuclear power plant. This has already greatly improved the notification procedures of incidents at nuclear plants to Federal, State, and local officials as well as the news media.

Philadelphia Electric Company reportedly is presently working with appropriate officials in developing a detailed emergency plan that will not only be acceptable but also workable. The lessons learned from TMI as well as the operations at Peach Bottom should result in the very best available communications system being in place when Limerick begins operation.

There has been some criticism that Limerick will result in excess capacity. It is LIFE/JOBS understanding that electricity generated by Limerick will reduce the electricity generated by high priced oil. That would mean the oil fueled units would in reality be the excess capacity. The reduction of use of imported oil would reduce the energy charge for consumers. That's the kind of excess capacity we need!

Only by cooperative action of government, labor and industry, can a rational energy policy result in the United States becoming self-sufficient in the field of energy. Nuclear power is a part of the mix needed. So of course is coal, hydro, and conservation. They are presently available with known technology.

As a result of TMI there has been a restraint on the nuclear industry. Other countries, both friend and foe, are going ahead with nuclear construction. We cannot afford to become second class in utilization of our energy resources, technical competence and skilled workmen.

LIFE/JOBS stands ready to work with government at all levels to insure there is adequate energy and sufficient jobs for Pennsylvanians. Limerick is part of that insurance.

Attachment #3 to Kostmayer Memo

LIMERICK ECOLOGY ACTION
Box 337, RD#2, Phoenixville, PA 19460
May 27, 1980

STATEMENT by Phyllis Zitzer, President, LEA

Members of Limerick Ecology Action are grateful to the Subcommittee on Energy and the Environment for conducting these hearings to investigate emergency evacuation planning for the Limerick nuclear power plants. Nearly all of our 400 members live within a 30 mile radius of the site. LEA, a member of The Environmental Coalition on Nuclear Power intervened in the construction license hearings conducted by the Atomic Energy Commission for the Limerick Reactors. Our primary concerns about the site were, and remain, the high population density problem and inadequate water supply.

The Montgomery County Planning Commission and members of the public were completely surprised when plans were announced to build a pair of reactors at the Limerick site. The land was privately purchased without anyone knowing of the intended use. Rather than contacting local community officials, the Philadelphia Electric Company (PECO) went to the Pennsylvania Public Utility Commission to obtain a Certificate of Necessity which allowed construction of a power plant at Limerick. While this did not approve the site for a nuclear installation, the result was inadequate consideration of alternate sites.

As early as 1971, before the construction license proceedings had begun, PECO had already invested 38,000,000 in the project and repeated cited increased [illegible] delay work at Limerick. The AEC staff did not make adequate cost/benefit analyses of alternative sites to determine whether the detrimental aspects of Limerick's siting and water supply problems could be eliminated or mitigated. Failure to properly consider environmental impacts and alternative sites before significant financial committment was made at Limerick has made a mockery of the regulatory process.

The entire water supply planning for the plants' operation was conducted in secrecy and is still unresolved. The question of whether Limerick was dependent upon construction of the Tocks Island Dam to allow diversion of water from the Delaware River at Point Pleasant resulted in a three year delay in the construction license hearings. The AEC made no independent review of the environmental impacts related to the diversion of water to the Limerick facility through Point Pleasant. At the time, the AEC staff did not contact the Delaware River Basin Commission concerning any adverse impacts related to the use of Delaware River water. Nor was the Susquehanna River Basin contacted to ascertain the availability of water in that region.

It has always been our contention that the water supply at Limerick is inadequate for the proposed nuclear facilities. Inadequate water supplies forced the decision to wet cooling towers, the decision to draw on the Delaware, the decision to channelize the Perkiomen, the decision to draw on non-existent water reservoirs, the decision to limit power during dry spells, and the decision-to-come with respect to developing water storage facilities. All of these are by-products of the key decision made in site selection, according to the Draft Environmental Impact Statement report: "Principally from a consideration of monetary costs of the selection criteria..."

Attachment #4 to Kostmayer Memo

STATEMENT OF
ALAN J. NOGEE
KEYSTONE ALLIANCE

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
U.S. HOUSE OF REPRESENTATIVES

MAY 27, 1980

We appreciate the opportunity to testify at this Congressional investigation into the Limerick nuclear plants. Such an investigation is, of course, many years and more than a billion dollars overdue. We hope that it is not too late to prevent the needless expenditure of billions more toward an unworthy cause.

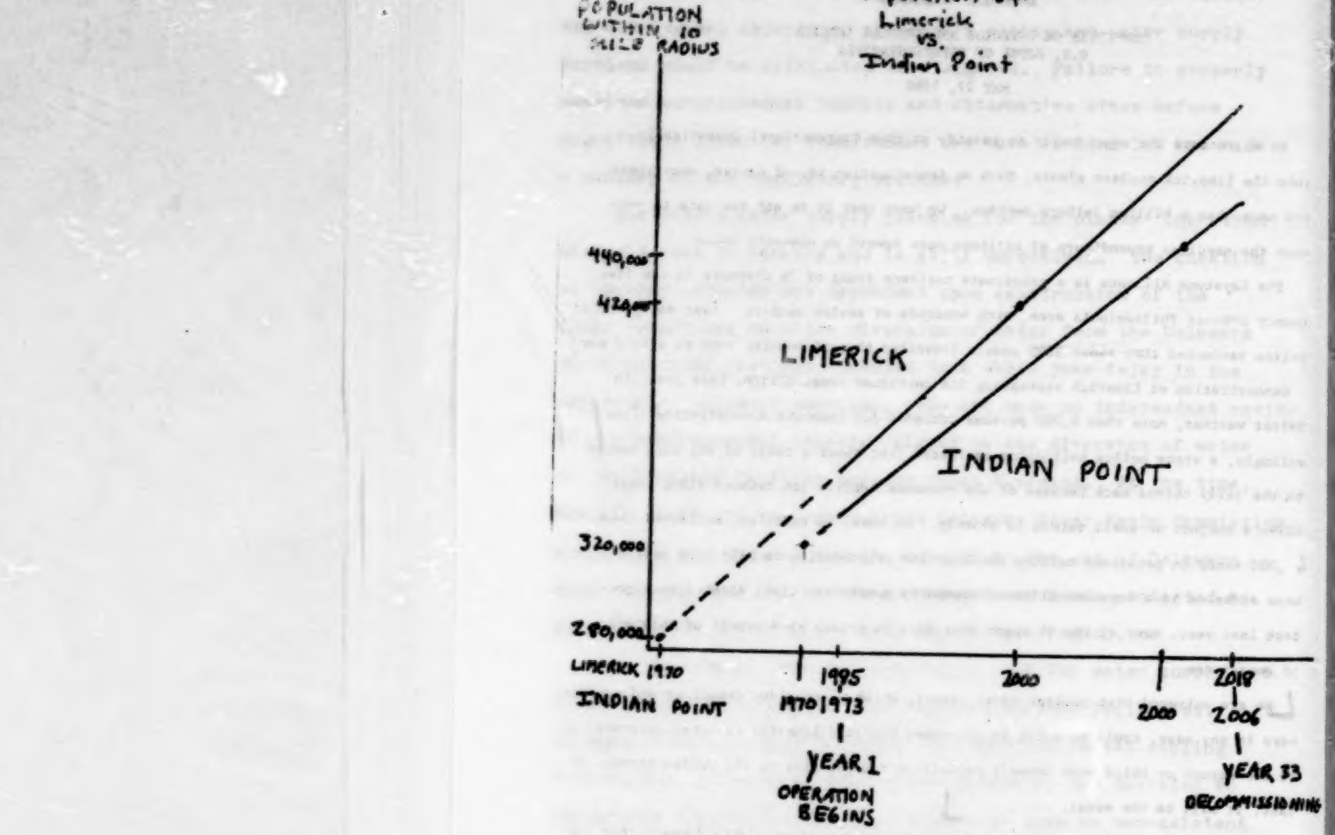
The Keystone Alliance is a grassroots citizens group of 24 chapters in the five county Greater Philadelphia area, with hundreds of active members. Last week, state police estimated that about 2500 people travelled through pouring rain to attend our demonstration at Limerick protesting its continued construction. Last year, in fairer weather, more than 6,000 persons attended our Limerick demonstration. Interestingly, a state police helicopter estimated that about a third of all cars headed to the rally turned back because of the enormous traffic jam created along route 422-- a subject we shall return to shortly. We have, in addition, collected them 6,000 names on petitions calling for Limerick construction to halt. 94 people were arrested in a Keystone Alliance sponsored nonviolent civil disobedience protest last year. Many of the 94 spent four days in prison as a result of this act of conscience.

We are outraged that nuclear power plants, which we consider dangerous and unnecessary in any case, could be built in our urban backyard. Limerick is often referred to as the second or third most densely poplulated nuclear site in the United States. In fact, it will be the worst. . . .

An accurate comparison of the population around two given plants demands that the comparison be made between the population around each during its lifetime. Thus, comparing Limerick's surrounding population density with Indian Point's, generally conceded to be the worst sited nuclear plant, one must compare the estimated population around Limerick when it is scheduled to begin operation in 1985 with Indian

FIGURE 1

Population of Limerick vs. Indian Point



Point's population when it began operating in 1973, or any two comparable points in the plants life cycles. Such a comparison is presented in Figure 1 based on population projections published by the Nuclear Regulatory Commission in its October 1979 study: "Beyond Defense-In-Depth: Cost and Funding of State and Local Government Radiological Emergency Response Plans and Preparedness in Support of Commercial Nuclear Power Stations," NUREG-0553.

Perhaps it is nitpicking to argue for the designation of Limerick as the "worst" nuclear site, at least from a perspective of population density within 10 and 30 miles around the plant. But considering testimony about emergency planning around Indian Point, it is worth placing Limerick in that perspective.

In hearings before the House Committee on Government Operations, Subcommittee Chairperson Moffett asked then Nuclear Regulatory Commission Chairperson Hendrie:

> Mr. Moffett. What would that mean in terms of an Indian Point kind of plant? Within 20 miles of almost 1 million people-- 910,000 people-- what would you do?... You cannot really say that it is possible to evacuate 910,000 people in a relatively short amount of time; can you?
>
> Mr. Hendrie. I do not think it is. I think that is exactly right.
>
> Mr. Moffett. Then, is not one of the lessons of Three Mile Island that the nuclear powerplants, such as Indian Point and Zion, should not be located so close to heavily populated areas?
>
> Mr. Hendrie. I think that is the direction that we have been moving on the regulatory staff for some time. This is since 1973 or 1974.[1]

In sworn testimony to the President's (Kemeny) Commission on Three Mile Island, Robert Ryan, director of the NRC's Office of State Programs, testified that the Indian Point site was "insane" from an emergency preparedness perspective.[2]

If Indian Point is insane, Limerick is no less. We couldn't squeeze 10,000 people into Limerick along the only major access/exit route--U.S. 422. How could that road evacuate the more than 400,000 people who will live within 10 miles of Limerick in the middle of its proposed lifetime? According to Mr. Ryan, the latest federal studies show that an accident "could spread radiation over a 10 mile radius in only a half-hour."[3]

What about the 5.6 million people who will live within 30 miles of Limerick by the year 2000?

Let us be clear that we consider evacuation the only acceptable alternative in the face of a possible nuclear meltdown. The NRC considered evacuating residents around TMI out to a distance of 20 miles during that crisis. And the NRC's Rogovin Commission investigating TMI concluded in its draft report, leaked to the New York Times, that plants should not be licensed which cannot be evacuated out to a distance of 30 miles.

The minimum acceptable evacuation zone around Limerick should include a 30 mile radius and the entire city of Philadelphia. Limerick is only 21 miles from Philadelphia's borders. Would we really expect that an evacuation order which extended only up to Philadelphia's borders, or included 2/3 of the city's population, would result in the excluded population remaining put? One fourth of the population around TMI evacuated even without evacuation orders. Without a planned, practiced evacuation, Philadelphia would be mired in chaos.

The consequences of not evacuating would be utterly catastrophic. In a study of the possible consequences of a TMI meltdown, Princeton University nuclear physicists Jan Beyea and Frank von Hippel concluded that had the wind blown toward Philadelphia, a meltdown at TMI-2 might have caused up to 13,000 deaths in the Greater Philadelphia area. A meltdown in a mature TMI reactor could have caused as many as 32,000 cancer deaths. There would be additional tens of thousands of non-fatal cancers and genetic defects. There would be hundreds of thousands of thyroid nodules. TMI is more than 90 miles from Philadelphia. The damage from a reactor only 21 miles away is unimaginable.

Evacuating is impossible. Not evacuating is unthinkable. It is hardly gratifying to us to know that the NRC is "moving in the direction" of not locating nuclear plants so close to heavily populated areas. What is unsafe for the rest of the country is unsafe for Philadelphia as well.

If a plant is unsafe, with possible catastrophic effects, it should not operate. In the view of the Keystone Alliance, therefore, we should not have any nuclear plants. But we are told to be "practical"-- that some parts of the country are dependent on nuclear power. In other words, there is an implicit tradeoff between public safety, electric demand and economics. But if we look for the institution which weighs this tradeoff, we can't find it. The NRC refuses to consider the cost of a facility or its need-- that is the province of the utility and the state Public Utilities Commission. The PUC, of course, is not empowered to consider safety-- that being pre-empted by the federal government. And in a facility under construction, like Limerick, neither agency will consider it seriously until construction is complete and its enormous cost irreversibly spent.

Limerick is a perfect example of where safety and economic factors must be considered together. For whatever position one takes on the advisability of shutting down already operating plants, what rationale can there be for completing a plant which is unsafe and unnecessary? There is considerable evidence that Limerick could be cancelled now and replaced with safer and cheaper alternatives.

The Council on Economic Priorities has done an important 1979 study comparing investment in proposed nuclear plants at Jamesport, Long Island, with a comparable investment in basic conservation measures-- installing insulation and storm windows-- and construction of solar domestic water heaters. 5

The study concluded that the conservation and solar investment, paid back over 30 years, would save between $11 billion and $15 billion in reduced electric and heating bills. In addition, twice as much oil would be conserved and twice as many jobs created by the conservation and solar route. Through the replacement of electric water heating with solar, and because insulating buildings conserves electricity used for air-conditioning during summer peak demand times, the conservation and solar option effectively saves about 2/3 as much electricity as the nuclear plants create. This is more than enough additional electric supplies for our area, with Philadelphia Electric's 37% excess generating capacity.

This is an energy policy that makes sense-- locally and nationally. It plugs wasteful leaks instead of running resources through them at ever increasing rates. It conserves oil cheaply. The American Institute of Architects calculates that insulating our homes nationally would conserve 12.5 million barrels of oil a day, while we currently import only 8.5 million barrels a day. In contrast, substituting nuclear plants for all of our oil burning electric plants would reduce our dependence on foreign oil from about 2/3 of our current total oil use to about 60%, according to energy economist Vince Taylor, in his book Energy: The Easy Path. Nor could such a substitution practically be made. Nuclear power can't efficiently substitute for cycling and peak demand oil burning generators. And according to NRC Commissioner Peter Bradford, since oil burning plants burn bottom of the barrel residual oil, which can't be used for anything else, and is in surplus supply relative to other grades of oil, nuclear power can make no short term impact on reducing our dependence on foreign oil supplies.

Conservation and solar investment creates employment where it is needed. Employing middle and low-skilled people in our cities as well as the suburbs, more than 3/4 of conservation and solar investment is spent in the local economy, where it recycles to the advantage of small businesses and consumers. In contrast, 3/4 of nuclear investment leaves the local economy-- ripped off by multinational reactor manufacturers and Wall Street banks.

There are other renewable resource options for generating electricity also. A Pennsylvania hydroelectric company estimates that there are enough small existing dams in our state waiting to be backfit with inexpensive hydroelectric generators to substitute for a nuclear plant. Several of the sites are on the Schuylkill River.[6]

In my recent testimony to the state Public Utilities Commission at the last Philadelphia Electric (PECO) rate hike hearings, I compared the cost of wind powered electric generators with the cost of Limerick generated electricity. Wind turned out to be less expensive.

The comparison utilized estimates of a nuclear plant scheduled to go on line in 1988 from PECO's 1977 publication "Electric Power Generation Economics" by Vince Boyer with updates supplied by PECO's forecasting and planning department.

In their publication, PECO assumes a construction cost of $1340/kw. While PECO officially maintains that Limerick will cost $3.2 billion ($1516/kw), an engineer in their forecasting department recently conceded [illegible] the final cost is actually expected to be at least $3.5 billion, or $1658 [illegible] 24% higher than the published figure. Other estimates, such as the State Consumer Advocate's, are even higher.

Decommissioning and spent fuel storage costs were explicitly excluded from PECO's calculations, though they supply estimates for these costs (since increased by 70% in their testimony in the rate case).

Their estimate of fuel costs was based on only the first 10 years of the plant's life. Their planning department supplied me with a life cycle fuel estimate based on the incredibly conservative assumption that uranium prices would continue to climb at 10-12% a year through 1998 and then decrease to only 6% a year, despite the fact that most of our domestic uranium supplies are expected to be exhausted about then. Nevertheless, their revised estimate increased the total fuel cost 70% over the published figure.

Finally, PECO calculations assumed a 70% capacity factor. Current experience with plants over 800mw indicates a capacity factor of 55 to 60%. With plants over 1000mw made by General Electric, like Limerick, the capacity factor has been only 50%.

Assuming a more realistic figure of 56.5% capacity factor, and PECO's conservative figures for construction, lifetime fuel, decommissioning and spent fuel storage costs, the estimate of Limerick produced electricity rises from the published figure of 5.4¢/kwh to 8.0¢/kwh.

In the same publication, PECO estimates wind power costs to also be 8.0¢/kwh, based on capital cost of wind stations of $1740/kw. Both General Electric and Westinghouse expect to be producing wind machines for $300-500/kw by 1985, however.

In his comments on my testimony, the Administrative Law Judge of the PUC faulted my analysis for not including the cost of wind power storage and not calculating actual wind flow in the Philadelphia area.

In fact, however, while wind storage costs must be included to make wind power exactly comparable to nuclear power, this is only relevant if the generating capacity in question is needed for additional ~~total~~ capacity. PECO admits that Limerick is not really needed to increase total capacity but to substitute for more expensive oil fired capacity. Wind capacity without storage is equally effective at saving fuel. In addition, PECO already has a pumped storage facility which could be used to store wind generated electricity instead of the fuels which it serves as storage for currently.

Furthermore, I have since located a wind generator company which sells wind machines currently in Mongomery County which will produce electricity at a lifetime cost of 7.1¢ and 7.8¢/kwh locally, cheaper than Limerick's 8.0¢/kwh.

The Pennsylvania Consumer Advocate has testified here and to the Public Utilities Commission that Limerick is unnecessary and uneconomical compared to coal plants as well. All of the above evidence indicates that Limerick could be economically replaced. A comprehensive study is needed to determine the optimum combination of conservation, renewable resources, and as a last resort, coal.

Meanwhile, Philadelphia Electric continues to spend more than $1 million a day on a plant which is unsafe and unnecessary. Who will stop them?

The PUC Law Judge said "Mr. Nogee's testimony would be of primary interest if this Commission were determining how Limerick should be built.... But this assumes, however, the authority to direct PECO to halt work on Limerick, an assumption which is not based on any cited provisions of the Public Utility Law."

We certainly place no faith in the NRC, totally discredited by the President's (Kemeny) Commission report on Three Mile Island, as well as the NRC's own Rogovin Commission report.

We hope that the House Interior Committee, which was responsive enough to hold these hearings, will now be responsible enough to call for an immediate halt to Limerick's construction. The outrageous location of the Limerick plants, with their exorbitant costs-- not to even mention the plant's water supply problems and the generic problems of lack of waste disposal or full liability insurance-- makes a mockery of our system of regulating monopolies, and thus a mockery of our free enterprise and democratic system. It is time we place public safety, real energy needs and people's financial welfare above the interests of the few monopoly corporations which direct all the energy investments in our economy for their own profit. It is time Congress stopped subsidizing the rich-- nuclear power electric bills would have been 40% higher last year without federal tax subsidies, according to the General Accounting Office[7]-- and help the people of this country develop clean, renewable sources of energy that we can own and maintain, and that will serve us, not destroy us.

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Attachment #5 to Kostmayer Memo

WOMEN'S INTERNATIONAL LEAGUE FOR PEACE AND FREEDOM
American Section, Philadelphia, Pa.

27 May 1980

Testimony before U.S. House Interior Subcommittee on Energy and the Environment, Congressman Kostmayer, in Bucks County, Pa.

A comparison:

Mt. St. Helen's erupted on May 18 and has killed perhaps nearly 100 people. It has devastated many square miles of land and has caused economic damage estimated at over $2 billion, and sent a cloud of ash across the country, causing many people with respiratory problems to seek hospital treatment.

If there had been a meltdown of a nuclear power plant, especially near a large city as Limerick will be, then, by the government's own study (WASH-740, 1965 update) a release of only 10% of the radioactivity from a 1000 Mw nuclear plant could result in 45,000 deaths, 100,000 injuries, and $17 billion(in 1965 dollars) damage, and could contaminate an area the size of the State of Pennsylvania. The radioactive cloud could not be seen, or felt, but it would be there.

Not only would the problems of evacuation and relocation be difficult, but they would last a long time, and the economic losses would be staggering. We do not know how long Mt. St. Helen's will continue to spew ashes, but we know that the release of radioactive gas, etc. from a meltdown of a nuclear plant would continue for a long time. The first wave of radioactivity would cause illness to many who are particularly susceptible; not only pregnant women and fetuses, and young children, but people with respiratory and heart problems, but other conditions, and old age. The radioactivity which would linger in the air and be deposited in the soil, water, and our food would eventually cause many cases of cancer and genetic defects in future generations.

The difference in these two scenarios is that the first is an act of God; the second would be an act of Man. In the words of an Engineering Professor at Swarthmore College, "It is irresponsible engineering to deploy a half-developed technology when we don't know how to dispose of the nuclear wastes ..." I would add, it is irresponsible to deploy a half developed technology when it has the potential for great disaster. It is a half developed technology because we don't know what to do when there is an accident; we don't know how to clean it up (we can't even get the door open!). Must we go on until there is a complete meltdown, a disaster worse than anything nature has given us?

Jane M. Thorson

Attachment #6 to Kostmayer Memo

TEXT OF A STATEMENT PRESENTED BY ALAN S. FINTZ
PRESENTED BEFORE THE HOUSE COMM. ON INTERIOR AND
INSULAR AFFAIRS, SUBCOMM. ON ENERGY AND THE ENVIRONMENT,
REGARDING THE NUCLEAR SITING AND LICENSING PROCESS, AND
THE LIMERICK ATOMIC POWER STATION, PA.- Tues., May 27, 1980

As is usually the case, the immediate scope of this hearing is limited to a narrow question: The Congress must decide, as a matter of procedure, whether preparation of evacuation plans should be a precondition to the siting of new nuclear power plants. Implicit in the procedural question is a threshhold issue of substance which we must address: Is it possible to develop an adequate evacuation plan, i.e.: a plan which will ensure the members of the population surrounding the plant that they can readily escape the consequences of an accidental domestic holocaust? How adequate a plan will suffice? What criteria shall we use to measure the adequacy of a plan?

Let's answer the easy questions first. Yes of course an evacuation plan must be required before plants are located or licensed for operation. It would be a violation of the due process rights of the local citizenry to subject them to the forseeable dangers of nuclear mishaps without planning to allow them to secure their lives and property from nuclear hazards. While we must thank Rep. Kostmayer and the Congress for holding this hearing, it is safe to say that the holding of this hearing is not gratuitous. Indeed it is essential to the protection of the procedural due process rights of the affected population that the citizens participate in the making of decisions that may alter their lives, liberty or property. The Three Mile Island incident has put us on notice that melt-downs and other grave mishaps are plausible and sufficiently forseeable to warrant conscientious steps to protect the public safety.

I must take strong exception to Mr. Boyer's suggestion, that the evacuation planning process can only be window dressing. If Mr. Boyer meant by this that an evacuation plan is unnecessary, he's clearly wrong. Reasonable men may differ violently as to the exact degree of danger posed by nuclear technology, but there is a firm consensus that the hazard is a real one, and that this hazard must be minimized. Surly Mr. Boyer realizes this.

Mr. Boyer and other nuclear proponents denigrate evacuation plans, perhaps, because whether or not they are necessary, these proponents understand that physical, human and temporal limitations would make it impossible to develop a plan adequate to serve its intended purpose.

Mr. Boyer seems to be asking us to treat such an unworkable plan as window dressing, hoping that the Congress will dispense with any legal prerequisites to licensing that such plans meet a substantive test of adequacy to secure the public safety. Such a substantive requirement of workability is essential. The public has no use for more paper plans; the public has no use for empty statements of intentions. The public is entitled to be reasonably confident that any approved evacuation plan is actually fit for its intended purpose.

From the evidence and, indeed, from the tenor of Mr. Boyer's remarks, it is fair to assume that no plan can possibly be developed that will ensure the safety of populations surrounding the Limerick plant, or any other plant. Mr. Boyer realizes this.

So what is the crux of the pro-nuclear argument?

Seeming to appeal to our sense of practicality, many nucler proponents lean heavily on the argument that life is full of risks. They reason that if citizens balance the perceived risks against the benefits of nuclear power, nuclear expansion will gain support. Yet, even if a majority of us were prepared to assume the foreseeable risks of a deepened commitment to nuclear technology, should we have the right to assume these risks for others?

Underlying the pro-nuclear position is an implicit assumption that the acceptability of these risks of nuclear energy generation is a political question, not a legal or constitutional one. They would argue for the propriety of letting a political majority of present citizens control the outcome of the debate. I take issue with the assumption: I believe that there are firm constitutional criteria to guide us in resolving this controversy. Because I believe that these criteria have not been addressed by earlier speakers, I respectfully request that the remainder of my remarks be given due consideration.

The principle of due process of law is the cornerstone of our American system of justice. No person's life, liberty or property may be taken by action of the government without due procecs of law. The essentials of due process are notice of a proposed action, and an opportunity to be heard on the matter.

While I thank Rep. Kostmayer once again for arranging this hearing, I must ask whether this or any similar meeting can satisfy the due process guarantees of the constitution, in the context of the nuclear issues at hand. I think not.

Due process is not satisfied by the mere holding of a hearing. Constitutional protection is not built of meaningless ritual. Due process demands that all those who are likely to be affected by a governmental action have some reasonable notice and an opportunity to be heard. I strongly suggest that the nature of nuclear technology makes it impossible to satisfy this constitutional mandtate, because so many of the potential effects of present nuclear commitments will be borne by citizens yet to be born. These effects are familiar to us: the cumulative venting of air- and water-born nuclear isotopes with normal operation; the hazards of nuclear fuel and waste transport and storage; the dangers of melt-downs or other major releases of nuclear material into the environment, the food chain, the gene pool. Nuclear technology is truly unique not only in the gravity and scope of its potential harms, but in the incredible permanence, pervasiveness and irreversibility of the foreseeable effects of many kinds of mishaps. However remote the probability of its occurrence, a future melt-down is a real possibility. Such an occurrence at any one plant would contaminate whole communities or regions, their populations of human and animal life, and the gene pool for the indefinite future. With this risk within our contemplation, the licensing of a plant can be seen as the extension of a reckless, uncontroled hand of the past into the future, threatening to impair the life, liberty or property of citizens as yet unborn.

These hazards are too well known to for them to be written off by us as Acts of God. This generation would be responsible, and yet long gone and unaccountable, for the effects of the actions we set in motion.

My point is a simple one: The foreseeable effects of today's nuclear activity are uniquely likely to reach into the future, permanently and irreversibly impairing the fundamental rights of persons not yet in being. Because these citizens are not now present, they cannot assert and exercise their constitutuional rights to notice and an opportunity to be heard at the time these significant decisions are made. By subjecting them to these risks without due process, we stand to violate the constitutional rights of entire generations. This is morally and legally repugnant.

It is not enough that today's voting public might be prepared to consent to nuclear expansion. It is in the essence of all constitutional protections that they limit the prerogatives of the voting majority where politically populat actions may violate the constitutional guarantees enjoyed by others. It is the genius of our system of government that constitutional protections are so dear that they may not be compromised even at the behest of a unanimous living electorate. I would not sacrifice our constitution or endanger the health of my childrens' children for the sake of a few kilowatt hours of electricity.

Some will argue that the notion of due process rights of future citizens has not been recognized formally by the courts. But consider that, as one earlier speaker noted, the laws of nature have always been in existence, and yet their meaning constantly unfolds with time and experience. The American Constitution may be viewed similarly. The full meaning of due process can only emerge in the context of new, previously untested circumstances. Perhaps no generation before ours has addressed the question of the due process rights of the unborn because ours is the first generation with the dubious technological tools to change our world irreversibly, to affect the vital interests of unborn individuals so profoundly. It is clear that the law is not static, that its reach and import must be reinterpreted to respond to new truths. We have seen this in the recent past: The simple notion that men and women of all races should enjoy all the rights of citizens seems self-evident to us, and yet these ideas were revolutionary only decades ago. I urge only that we have the sanity and decency to acknowledge once again that the time has come to discover new meaning in our treasured constitution.

To summarize, morality, logic and law demand that our counterparts in the future - our children - enjoy the same due process rights that we enjoy. I vigorously suggest that whenever we make the threshhold finding that our present acts pose a forseeable risk of irreversible and substantial injury to the fundamental life, liberty or property interests of future citizens, and where, by definition, the class of affected individuals includes many who have not been born, cannot have notice and cannot have an opportunity to be heard regarding decisions affecting them, the principle of due process demands that the presently living electorate should have no power to authorize such governmental action.

The government is more than an emodiment of the common will of living citizens. It is a public trustee for the future citizens' interests in a sound and sustainning environment. Due process should demand that the government limit the scope of its actions to those which pose no reasonable danger of irreversibly impairing the essential life interests of future generations.

Let us struggle to achieve prosperity in the present in ways which will not invade the living heritage held by us in trust for the future.

6/8/80

Attachment #7 to Kostmayer Memo

Testimony Before the Interior Subcommittee
on Energy and the Environment, U.S. House of
Representatives
The Honorable Peter H. Kostmayer, Chairman
Newtown, Pa.
May 27, 1980
by
John Pionski
Borough Manager
Norristown, Pa.

The great national debate continues. Should we or should we not construct and operate nuclear power plants? And who do we believe? Those who claim our resources of energy are diminishing and, therefore, see nuclear power as the solution? Or those who say the immense risks attached to nuclear power simply make it an untenable and frightening alternative?

So far, at least, those who favor nuclear power have won the day. Three Mile Island, notwithstanding. And we are moving ahead with nuclear expansion.

The power plant now under construction at Limerick in Montgomery County is the nearest example of the spread of nuclear energy. It will be completed and in operation only a few short years from now.

I am the Chief Executive Officer of the Borough of Norristown, the seat of government for Montgomery County and one of the nearest urban settlements to Limerick, to our northwest.

We are a community of 40,000. Most of us live in apartments or rowhouses in close proximity to each other. Many of us are elderly. Many of us rely on buses, trains, or walking as our sole means of transportation.

We are the home of county government and the courts. This swells our daytime population and congests our streets with vehicular traffic. Within our borders are a prison, two busy general hospitals, a large psychiatric hospital, and numerous nursing homes, boarding homes, and "half-way" houses filled with citizens who are cared for only marginally.

Those of us in Borough government feel as if we have a responsibility for the health, safety, and welfare of these people. Because we are near and available, we are the level of government most people call for help. And while we can provide a myriad of services answering many problems, we are not able to address ourselves to what could be the greatest challenge of all - the efficient and safe evacuation of our community in case of major catastrophe. In this regard, Norristown is not alone. Municipalities near Limerick are in a similar situation.

We in local government are far, far, away from the powers that be in Harrisburg and Washington. And, surely, the burdens of state and federal leaders are greater than the lowly municipal official. But why is it that we are rouinely ignored when important plans or decisions are made which directly affect our community's way of life?

It is assumed, for example, that emergency preparedness for nuclear accidents is right now being discussed and formulated in our capitals. At least, I hope it is. But in such planning surrounding nearby Limerick, it appears that most - if not all - municipalities are being left out.

This is a very unfortunate oversight. For municipalities - large or small - can call on a remarkable reservoir of emergency personnel. For instance, in Montgomery County alone there are 62 Townships and boroughs with a combined population of over 625,000. Nearly every one of these municipalities has a police department on duty at all times. Police officers are well trained in crowd and traffic control. They have ready access to an excellent communications system. Emergency coordination between different departments is smooth and efficient. They are trained to handle panic situations and can provide natural leadership in time of crisis.

In Montgomery County alone there are hundreds of volunteer fire departments with thousands of dedicated men and women who can be mustered in minutes for evacuation duty. They have access to emergency apparatus and they, too, have a first-rate communication and mutual aid system already established.

More than that volunteer fire fighters know their community. They know where the ill and infirm live. They know the schools and hospitals. They know how to react when fear and hysteria are rampant.

In some of the larger municipalities, such as Norristown or Lower Merion, there are full-time fire departments, as well as volunteers, who are always available for such crises.

Municipal governments can provide supplemental emergency assistance as well; dispatching of ambulances; water, sewer, and electrical services, temporary shelter, etc.

My mission today was to bring to your attention the necessity of including local government and its people into the planning process for emergency preparedness at Limerick. We represent hundreds of thousands of good citizens who, so far, don't know what to do or where to go in the event of trouble.

We can, and do, coordinate vast human resources standing ready to help and lead.

I sincerely hope that I've made my point. For I believe that a catastrophic nuclear plant accident can happen. If it does, it will be essential that the most amount of people could be removed and protected in the least amount of time. Good planning and execution will save thousands of lives.

Please don't forget us.

Attachment #8 to Kostmayer Memo

OUR ENERGY ALTERNATIVES: IS LIMERICK REALLY NECESSARY?

With all our safe energy sources and the tremendous resource of wise energy use, I see no reason for the further development of nuclear power. Isn't it interesting and ironic to hear the proponents of nuclear power explain the safety of these plants, while they plan for mass evacuation?

We have an energy source that will produce no radioactive waste, no carbon dioxide build-up in our atmosphere, requires no evacuation plan and doesn't count on any new technological breakthrough. It can do more to solve our energy problems than any of our conventional energy sources of oil, gas, coal or nuclear. And that source can completely eliminate the need for imported oil and nuclear power.

Wise energy use is that source, which can stimulate innovation, create employment and economic growth. It is also the first step in the development of our safe renewable energy alternatives.

We have many energy sources that continue to be ignored and therefore wasted. The development of the hybrid poplar for alcohol could eliminate the need for imported oil in a 10-year period. In fact, the 587 acres of the Limerick Plant site, if utilized to grow trees, could produce approximately 8 million gallons of alcohol fuel in that time. Solar energy could supply more than half our heating requirements now. Methane gas from our sewage could double our natural gas reserves now. Our garbage is also a tremendous fuel source with a ton having the energy equivalency of a barrel of oil. In Chester County alone, 1,100 tons of residential trash is thrown out daily. The development of small scale hydroelectric and wind power for both electric and direct mechanical work could supply much additional power.

The following is an account of my feelings during the T.M.I. accident which I wrote earlier this year, entitled, "T.M.I. One Year Ago:"

"A year ago I was working hurriedly to reach the goal I had set for myself - of finishing my wind generator by April 1. It was March 30 and I had planned to get the air-brake to finish my system. Ironically, it was in Harrisburg. I was familiar with Limerick Ecology Action activities and also with the Keystone Alliance. Yes, I was one of the handful of people who knew what the "China Syndrome" was before the movie came out.

By Saturday I had finished the blades for the wind-charger and painted the air-brake and kept listening to the news for reports of the T.M.I. accident.

Sunday, I was very depressed. The media didn't seem to know what was going to happen at T.M.I. A friend stopped (who had formerly worked in the nuclear industry), equipped with a dosemeter and geiger counter, showed me nothing had yet registered in this area, but he was packed and ready to leave in case the accident got worse.

The wind was blowing from the west as I carried the blade and brake to the top of my tower. I didn't wear my safety belt that day while working on the top. Somehow, there just didn't seem to be any point to it. It had taken me a year and a half to get this far. Now, during a nuclear accident, I was finishing it. I was reminded then what two friends had told me several years earlier while discussing my plans for a wind generator and solar equipment: "If there's an accident at Limerick, anything you build or the positive attitude you're trying to share with others won't mean a thing." A short time later they moved from the area because of P.E.'s construction at Limerick.

Well, this accident wasn't at Limerick but at Harrisburg, and we were still threatened.

I told my parents this will be my monument: if there is a meltdown at Harrisburg, at least others will someday know I was trying to do something positive."

We have been told by some nuclear "experts" that, because we aren't trained in this field, we should have no say in its development. Rather than being nuclear experts, we are experienced in life. And, as E. F. Schumacher says in his book, "Small Is Beautiful: Economics as if People Mattered," "The case for hope rests on the fact that ordinary people are often able to take a wider view, and a more 'humanistic' view, than is normally being taken by experts."

+ conclusion

Jim Crater
Vice-President
Limerick Ecology Action

1211 Temple Rd
Pottstown, Pa. 19464

LIMERICK HEARING TESTIMONY

STATEMENT OF HAROLD R. DENTON
DIRECTOR, OFFICE OF NUCLEAR REACTOR REGULATION
NUCLEAR REGULATORY COMMISSION
BEFORE
THE INTERIOR SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT
AT
BUCKS COUNTY COMMUNITY COLLEGE
NEWTOWN, PENNSYLVANIA
MAY 27, 1980

I am pleased to appear today to discuss the status of the Limerick project with respect to 1) emergency planning and preparedness and 2) the implications of lessons learned from the accident at Three Mile Island.

EMERGENCY PLANNING

The status of the Limerick project is that the applicant has not submitted a Final Safety Analysis Report and therefore, we have not yet evaluated many of the emergency planning and preparedness aspects of the Station and site. However, I can describe the emergency planning criteria which will be used for this case, and the manner in which our staff will conduct its review. I will also describe two special studies which are underway.

Significant changes have taken place in the NRC's approach to emergency planning. In the past the NRC staff relied primarily upon plant design features for protection of the public. Our current approach places significantly increased emphasis on emergency planning as a necessary additional measure required for the protection of public health and safety. These changes have stemmed in part from our experience with TMI, and also from an extensive study which began back in 1976 by a joint NRC/EPA task force. Probably the most influential development is an explicit consideration of the total spectrum of potential radiological accidents. Formerly the planning process had been based only on a limited portion of the spectrum - to accidents of severity up to and including the most serious design basis accident. Now, the planning process has been expanded to include core melt accidents.

The traditional interpretations usually associated with such concepts as "the facility environs" or "rapid notification" take on a new meaning when considered in light of planning for the entire accident spectrum. Including the severe accidents increases the planning distances involved and shortens the time available for decision making and early warning of the public.

Detailed planning has been expanded to include the Emergency Planning Zone as recommended by the joint NRC/EPA task force. The Emergency Planning Zone concept provides for two generic planning zones around the nuclear power plant - an inner zone of about 10 miles in radius for the plume exposure pathway and an outer zone of about 50 miles in radius for the ingestion exposure pathway. Hence our current criteria contain objective requirements on the time for providing early warning and clear instructions to the public in the event of a serious accident, as well as provisions for taking protective measures based on predetermined action levels readily available to the facility operator in the reactor control room.

Our perception of the role of State and local plans developed in support of the licensees emergency plans has also changed. Whereas previously we considered offsite planning as a matter of prudence, we now consider it a matter of necessity. We, in cooperation with the Federal Emergency Management Agency, have developed specific acceptance criteria not only for licensees plans but also for State and local plans which we consider essential in assuring an acceptable state of preparedness.

The specific requirements and details which define our current approach on emergency preparedness are set forth in our proposed rule changes to 10 CFR Part 50 and in NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants". The final rule is expected to be published in June of this year. The NUREG report provides interim guidance and acceptance criteria for licensees as well as State and local governments in the preparation of their radiological emergency plans. The document was the product of a joint effort between NRC and FEMA, and it will be used by the two agencies in determining the adequacy of State, local and licensee emergency plans preparedness. Prior to issuance of an operating license for Limerick, NRC will require an acceptable finding on the overall state of emergency preparedness which includes the supporting State and local governments. Our finding will be based not only on an assessment of the plans developed by the Philadelphia Electric Company, but will also include a review of the FEMA findings as to whether the State and local plans are adequate and capable of being implemented.

President Carter on December 7, 1979 directed FEMA to take the lead responsibility for all off-site nuclear emergency planning and response. The effect of that decision is that FEMA rather than NRC, will now assess State and local emergency response plans and make findings as to the adequacy of those plans as well as the State and local capability to implement such plans. NRC and FEMA issued a Memorandum of Understanding on January 14, 1980 which delineates the authority and responsibility of each agency, and the cooperative measures required to achieve our common goal. FEMA's findings will be provided to the NRC and will be used by our staff in the licensing process for making a determination on the overall state of emergency preparedness for new applications for a license as well as for current operating plants. Chairman Ahearne has sent a letter to Senator Simpson which proposes new legislation in this area. The proposed changes would give total responsibility to FEMA for offsite preparedness including public participation in the determination of plan adequacy. The FEMA determination would then be final and not subject to the adjudicatory process in NRC proceedings similar to the EPA role in water matters.

Although the proposed rule on emergency preparedness has not yet been made final, it would establish requirements for rapid identification and uniform classification of accidents, together with prompt notification to offsite authorities. Emergencies are to be classified into one of four categories, and based on objective criteria known as Emergency Action Levels. These Emergency Action Levels are observable process parameters in the control room.

Our intent is to simplify the decision making process during the initial stages of an emergency, and to minimize the subjectiveness during a potentially stressful situation. Because State and local plans would recognize the same emergency classification scheme, we expect that a better understanding on the part of the responsible offsite agencies regarding the nature of the emergency and its potential consequences in the environs will result. To assure effective communications offsite, we are requiring the facility operator to install redundant communications systems which provide for direct contact with the State and local officials having the authority and responsibility for implementing protective measures in the environs. We will also require the applicant to establish a near-site Emergency Operations Facility for the continued evaluation and coordination of all licensee activities related to an emergency having or potentially having environmental consequences. This facility will provide information needed by Federal, State, and local agencies for implementation of their emergency plans in addition to making available a centralized meeting location for key representatives from these agencies.

Another significant requirement deals with providing early warning and clear instructions to the public in the event of a serious radiological emergency. We are requiring that the capability be in place which permits initial notification by offsite officials to the public within approximately 10 miles from the facility, within about 15 minutes following notification from the licensee that a potentially serious emergency condition exists. Associated with this system is a requirement for a public information program which includes an explanation as to how the public would be notified, what actions the public would be expected to take in the event of an emergency.

Our emergency planning requirements have also been expanded to assure continued and effective assessment of actual or potential consequences both onsite and offsite. We are requiring additional offsite dosimetry in all sectors surrounding the plant and in other areas of special interest in the environs. Within the plant, we are requiring significantly extended monitoring capability in order to ensure that the radiological monitoring instrumentation will remain on-scale even in the event of very serious core melt accidents. We have also established requirements for an onsite technical support center which is intended to provide in-depth technical support to the control room activities. This center will be habitable during emergencies to the same extent as the reactor control room, and it will alleviate the congestion and confusion in the control room which was in evidence during the accident at TMI-2.

In order to assure effective implementation of emergency measures in the environs we are requiring the applicant to have detailed written agreements with all parties having a response role. These agreements will delineate the emergency measures to be provided and the mutually acceptable criteria for their implementation. In addition, the State and local plans will contain provisions for explicit protective measures within the 10 mile Emergency Planning Zone, including detailed evacuation plans out to that distance. In the case of Limerick, the affected counties include Berks, Chester, and Montgomery.

We have also increased our emphasis on the requirements for continued maintenance of an adequate state of emergency preparedness throughout the life of the plant. We are requiring additional specialized training and periodic retraining for various categories of emergency personnel - ranging from the onsite emergency coordinator to the offsite local services. We are also requiring periodic emergency preparedness exercises. These exercises will involve Federal, State, and local government participation but will not involve mandatory public participation.

SPECIAL STUDIES

We have requested the applicant to submit evacuation time estimates so that special planning problems around the facility can be identified. This should be completed and made available within the next few weeks.

In addition we have requested FEMA to perform independent studies on this matter. We understand that the FEMA time estimates will be completed in June, 1980. A significant concern related to protective measures offsite centers around the various institutions located within the 10 mile Emergency Planning Zone. There are a total of 16 facilities for which additional planning considerations would be required. Four of the institutions in particular - the Pennhurst Center, the Pottstown Memorial Medical Center, the Graterford Prison, and the Montgomery County Geriatric and Rehabilitation Center - will require further study because of their proximity to the plant and/or the extensive resources and time needed for evacuation. For these situations, analysis which considers various alternate protection strategies including sheltering and the use of radioprotective drugs will be needed.

LESSONS LEARNED FROM THREE MILE ISLAND

The licensee's FSAR must address the upgrading actions taken as a result of the experience from the accident at TMI-2 and the recommendations of official studies and investigations of the accident.

We will review the licensees actions to assure that they meet the standards and actions which the NRC has concluded are needed.

These investigations include those that have been conducted by the Congress, the General Accounting Office, the President's Commission on the Accident at Three Mile Island, the NRC Special Inquiry Group, the NRC Advisory Committee on Reactor Safeguards (ACRS), the Lessons-Learned Task Force and the Bulletins and Orders Task Force of the NRC Office of Nuclear Reactor Regulation, the Special Review Group of the NRC Office of Inspection and Enforcement, the NRC staff Siting Task Force and Emergency Preparedness Task Force, and the NRC Offices of Standards Development and Nuclear Regulatory Research.

The results of the staff's review of these investigations and reports are addressed in "NRC Action Plans Developed as a Result of the TMI-2 Accident", NUREG-0660 (referred to as the Action Plan). This Action Plan is currently undergoing review and approval by the Commission.

Also, the staff issued a letter on October 10, 1979, to Philadelphia Electric, specifying followup actions resulting from the NRC staff reviews. The licensees were requested to consider this guidance in the development of plant design and procedures and to include a description of their actions taken in this regard in their application for an operating license.

A list of additional proposed requirements was developed in January and February 1980 for use on pending license applications. This list was tentatively approved by the Commission in early 1980. The short-term operating reactor requirements (the October 10, 1979 letter) and the additional operating license conditions developed in February 1980 constitute a comprehensive of TMI related improvements developed by NRC to be achieved by a new plant before loading of fuel and pre-operational testing. This set of requirements has come to be called the near-term operating license list.

Recently, the staff has developed additional requirements to be satisfied before a reactor is permitted to operate at full power. This list has recently been approved by the Commission.

In addition, there are a number of studies and criteria development activities that will eventually lead to additional TMI-related requirements to be issued by the NRC in the future. These studies and activities as well as the near-term operating license list are addressed in NUREG-0660.

A brief description of the tentatively approved or proposed licensee requirements is presented in Appendix A of this testimony.

Implementation of the Action Plan will improve the operation of the plant so that the number of events that could lead to accidents is reduced. It will also improve the ability of the operating staff to recognize such events and take appropriate corrective actions. The prevention of accidents is addressed through improvements in the selection and training of not only the operators, but all the plant staff, and improvements required in the content and level of training courses, in the use of plant simulators, in operating procedures, and in the design of the controls and instrument displays in the control room. These specific improvements both reduce the incidence of accident situations and increase the ability of the operating staff to arrest an accident before any serious consequences result. Improvements in the evaluation of operating experience and the auditing of day-to-day plant operations are also to be instituted.

Means of improving current plant designs were also identified. The accident reemphasized the importance of high system reliability, even though there were no significant equipment failures, other than the relief valve on the pressurizer. Therefore, the action plan contains requirements for the assessment of the reliability of some of the engineered safety features (e.g., auxiliary feedwater, emergency core cooling, containment isolation, and decay-heat removal including natural circulation) and an overall assessment of accident probabilities and consequences using simplified reliability analyses for all plants. These analyses are directed toward identifying and correcting specific weaknesses in current designs.

In addition to these requirements, the staff, on May 6, 1980 requested the licensee to conduct a risk evaluation of the Limerick Generating Station. This evaluation would utilize the methodology used in the Reactor Safety Study (WASH-1400), but would include Limerick Generating Station plant specific and site specific information in order to arrive at a relative risk comparison for the Limerick Generating Station as compared to the WASH-1400 reference plant.

This concludes my prepared remarks. Thank you for this opportunity to appear before your subcommittee.

APPENDIX A
TO THE TESTIMONY OF
HAROLD R. DENTON
MAY 27, 1980

A. OPERATIONAL SAFETY

1. SHIFT TECHNICAL ADVISOR

A technical advisor to the shift supervisor shall be present on all shifts and available to the Control Room within 10 minutes.

The Shift Technical Advisor shall have a technical education, which is taught at the college level and is equivalent to about 60 semester hours in basic subjects of engineering and science, and specific training in the design, function, arrangement and operation of plant systems and in the expected response of the plant and instruments to normal operation, transients and accidents including multiple failures of equipment and operator errors.

2. SHIFT SUPERVISOR ADMINISTRATIVE DUTIES

Review the administrative duties of the shift supervisor and delegate functions that detract from or are subordinate to the management responsibility for assuring safe operation of the plant to other personnel not on duty in the control room.

3. SHIFT MANNING

The minimum shift crew for a unit shall include three operators, plus an additional three operators when the unit is operating. Shift staffing may be adjusted at multi-unit stations to allow credit for operators holding licenses on more than one unit.

In each control room, including common control rooms for multiple units, there shall be at all times a licensed reactor operator for each reactor loaded with fuel and a senior reactor operator licensed for each reactor that is operating. There shall also be onsite at all times, an additional relief operator licensed for each reactor, a licensed senior reactor operator who is designated as shift supervisor, and any other licensed senior reactor operators required so that their total number is at least one more than the number of control rooms from which a reactor is being operated.

Administrative procedures shall be established to limit maximum work hours of all personnel performing a safety-related function to no more than 12 hours of continuous duty with at least 12 hours between work periods, no more than 72 hours in any 7 day period, and no more than 14 consecutive days of work without at least 2 consecutive days off.

4. REVISE SCOPE AND CRITERIA FOR LICENSING EXAMINATIONS

All reactor operator license applicants shall take a written examination with a new category dealing with the principles of heat transfer and fluid mechanics, a time limit of nine hours, and a passing grade of 80 percent overall and 70 percent in each category.

All senior reactor operator license applicants shall take the reactor operator examination, an operating test, and a senior reactor operator written examination with a new category dealing with the theory of fluids and thermodynamics, a time limit of seven hours, and a passing grade of 80 percent overall and 70 percent in each category.

5. EVALUATION OF ORGANIZATION AND MANAGEMENT IMPROVEMENTS OF NEAR-TERM OPERATING LICENSE APPLICANTS

The licensee organization shall comply with the findings and requirements generated in an interoffice NRC review of licensee organization and management.

The review will be based on an NRC document entitled Draft Criteria for Utility Management and Technical Competence. The first draft of this document was dated February 25, 1980, but the document is changing with use and experience in ongoing reviews. These draft criteria address the organization, resources, training, and qualifications of plant staff, and management (both onsite and offsite) for routine operations and the resources and activities (both onsite and offsite) for accident conditions.

Establish a group that is independent of the plant staff but is assigned on site to perform independent reviews of plant operational activities and a capability for evaluation of operating experiences at nuclear power plants.

6. SHORT-TERM ACCIDENT ANALYSIS AND PROCEDURE REVISION

Analyze small-break LOCAs over a range of break sizes, locations and conditions (including some specified multiple equipment failures) and inadequate core cooling due to both low reactor coolant system inventory and the loss of natural circulation to determine the important phenomena involved and expected instrument indications. Based on these analyses, revise as necessary emergency procedures and training.

7. SHIFT RELIEF AND TURNOVER PROCEDURES

Revise plant procedures for shift relief and turnover to require signed checklists and logs to assure that the operating staff (including auxiliary operators and maintenance personnel) possess adequate knowledge of critical plant parameter status, system status, availability and alignment.

8. SHIFT SUPERVISOR RESPONSIBILITIES
Issue a corporate management directive that clearly establishes the command duties of the shift supervisor and emphasizes the primary management responsibility for safe operation of the plant. Revise plant procedures to clearly define the duties, responsibilities and authority of the shift supervisor and the control room operators.

9. CONTROL ROOM ACCESS
Revise plant procedures to limit access to the control room to those individuals responsible for the direct operation of the plant, technical advisors, specified NRC personnel, and to establish a clear line of authority, responsibility, and succession in the control room.

10. PROCEDURES FOR FEEDBACK OF OPERATING EXPERIENCE TO PLANT STAFF
Review and revise, as necessary, procedures to assure that operating experiences are fed back to operators and other personnel.

11. NSSS VENDOR REVIEW OF PROCEDURES
Obtain nuclear steam supply system (NSSS) vendor review of low-power testing procedures to further verify their adequacy.

12. CONTROL ROOM DESIGN (NOTE 1)
Perform a preliminary assessment of the control room to identify significant human factors deficiencies and instrumentation problems and establish a schedule approved by the NRC for correcting deficiencies. Design and install a safety parameter display console. Control room designs will be altered where required to comply with industry standards and regulatory guides.

13. TRAINING DURING LOW-POWER TESTING

Define and commit to a special low-power testing program approved by NRC to be conducted at power levels no greater than 5 percent for the purposes of providing meaningful technical information beyond that obtained in the normal startup test program and to provide supplemental training.

14. NSSS VENDOR REVIEW OF PROCEDURES

Obtain NSSS vendor review of power ascension test and emergency procedures to further verify their adequacy.

15. PILOT MONITORING OF SELECTED EMERGENCY PROCEDURES FOR NEAR-TERM OPERATING LICENSE APPLICANTS

Correct emergency procedures, as necessary, based on the NRC audit of selected plant emergency operating procedures (e.g., small-break LOCA, loss of feedwater, restart of engineered safety features following a loss of ac power, steam-line break, or steam-generator tube rupture).

16. TRAINING DURING LOW-POWER TESTING

Supplement operator training by completing the special low-power test program. Tests may be observed by other shifts or repeated on other shifts to provide training to the operators.

17. REACTOR INSPECTOR AT OPERATING REACTORS

A NRC resident inspector will be assigned to each site.

18. CONTROL ROOM DESIGN REVIEW

NRC review of applicant's preliminary assessment of the control room design to determine whether the assessment is adequate and identify any necessary corrections and approve the schedule for correction of the deficiencies.

19. IMMEDIATE UPGRADING OF OPERATOR AND SENIOR OPERATOR TRAINING AND QUALIFICATION

Applicants for SRO license shall have 4 years of responsible power plant experience, of which at least 2 years shall be nuclear power plant experience (including 6 months at the specific plant) and no more than 2 years shall be academic or related technical training.

Certifications that operator license applicants have learned to operate the controls shall be signed by the highest level of corporate management for plant operation.

Revise training programs to include training in heat transfer, fluid flow, thermodynamics, and plant transients.

20. ADMINISTRATION OF TRAINING PROGRAMS FOR LICENSED OPERATORS (NOTE 1)

Training instructors who teach systems, integrated responses, transient and simulator courses shall successfully complete a SRO examination.

Instructors shall attend appropriate retraining programs that address, as a minimum, current operating history, problems and changes to procedures and administrative limitations. In the event an instructor is a licensed SRO, his retraining shall be the SRO requalification program.

21. REVISE SCOPE AND CRITERIA FOR LICENSING EXAMS
Applicants for operator licenses will be required to grant permission to the NRC to inform their facility management regarding the results of examinations.

Contents of the licensed operator requalification program shall be modified to include instruction in heat transfer fluid flow, thermodynamics, and mitigation of accidents involving a degraded core.

The criteria for requiring a licensed individual to participate in accelerated requalification shall be modified to be consistent with the new passing grade for issuance of a license.

Requalification programs shall be modified to require specific reactivity control manipulations. Normal control manipulations, such as plant or reactor startups, must be performed. Control manipulations during abnormal or emergency operations shall be walked through and evaluated by a member of the training staff. An appropriate simulator may be used to satisfy the requirements for control manipulations.

22. SHORT-TERM ACCIDENT ANALYSIS AND PROCEDURE REVISION
Analyze the design basis transients and accidents including single active failures and considering additional equipment failures and operator errors to identify appropriate and inappropriate operator actions. Based on these analyses, revise, as necessary, emergency procedures and training. This requirement was intended to be required to be completed in early 1980, however some difficulty in completing this requirement has been experienced. Clarification of the scope and revision of the schedule are being developed and will be issued by July 1980. Holders of approved evaluation models will evaluate the uncertainty of small-break ECCS performance calculations.

23. TRAINING AND QUALIFICATION (NOTE 1)

Each licensee will be required to review and justify the adequacy of his training program for all operations personnel, including maintenance and technical personnel.

24. SIMULATOR USE AND DEVELOPMENT (NOTE 1)

Interim changes will be required as identified by an NRC review of training simulators.

B. SITING AND DESIGN

1. TRAINING FOR MITIGATING CORE DAMAGE

Develop a training program and instruct all operating personnel in the use of installed systems, including systems that are not engineered safety features, and instrumentation to monitor and control accidents in which the core may be severely damaged.

2. RELIEF AND SAFETY VALVE TEST REQUIREMENTS

Complete tests to qualify the reactor coolant system relief and safety valves under expected operating conditions for design basis transients and accidents.

3. CONTAINMENT DEDICATED PENETRATION

Install a containment isolation system for external recombiners or purge systems for postaccident combustible gas control, if used, that is dedicated to that service only and meets the single-failure criterion. Comply with interim NRC purge and vent position

4. RELIEF AND SAFETY VALVE POSITION INDICATION

Install positive indication in the control room of relief and safety valve position derived from a reliable valve position detection device or a reliable indication of flow in the valve discharge pipe.

5. IE BULLETINS ON MEASURES TO MITIGATE SMALL-BREAK LOCAs AND LOSS OF FEEDWATER ACCIDENTS

   a. Review all valve positions, positioning requirements, positive controls and related test and maintenance procedures to assure proper ESF functioning.

   b. Review and modify, as required, procedures for removing safety-related systems from service (and restoring to service) to assure operability status is known.

   c. For boiling water reactors, describe the automatic and manual actions necessary for proper functioning of the auxiliary heat removal system.

   d. For boiling water reactors, describe all uses and types of reactor vessel level indication for both automatic and manual initiation of safety systems. Describe other instrumentation that might give the operator the same information on plant status.

6. REACTOR COOLANT SYSTEM VENTS

Install reactor coolant system and reactor vessel head high-point vents that are remotely operable from the control room.

7 . PLANT SHIELDING

Provide (1) a radiation and shielding design review that identifies the location of vital areas and equipment in which personnel occupancy may be unduly limited or safety equipment may be unduly degraded by radiation during operations following an accident resulting in a degraded core, and (2) a description of the types of corrective actions needed to assure adequate access to vital areas and protection of safety equipment.

Complete modifications to assure adequate access to vital areas and protection of safety equipment following an accident resulting in a degraded core.

8. POSTACCIDENT SAMPLING

Provide (1) a design and operational review of the capability to promptly obtain and perform radioisotopic and chemical analyses of reactor coolant and containment atmosphere samples under degraded core accident conditions without excessive exposure, (2)a description of the types of corrective actions needed to provide this capability, and (3) procedures for obtaining and analyzing these samples with the existing equipment. Complete corrective actions needed to provide the capability to promptly obtain and perform radioisotopic and chemical analysis of reactor coolant and containment atmosphere samples under degraded-core conditions without excessive exposure.

9. CONTAINMENT ISOLATION DEPENDABILITY

Provide (1) containment isolation on diverse signals, such as containment pressure or ECCS actuation, (2) automatic isolation of nonessential systems (including the bases for specifying the nonessential systems), (3) no automatic reopening of containment isolation valves when the isolation signal is reset.

10. FINAL RECOMMENDATIONS OF BULLETINS AND ORDERS (B&O) TASK FORCE (NOTE 1)

Any failure of a PORV or safety valve to close should be reported to the NRC promptly. All challenges to the PORVs or safety valves should be documented in the annual report.

11. DEGRADED CORE

Selected licensees or owners groups will be required to address the feasibility of severe accident mitigation features.

j. For General Electric designed reactors, provide a design study of means of reducing thermal cycling of the reactor vessel by depressurizing with other than the full actuation of the ADS.

k. For General Electric designed reactors, provide an evaluation of the concerns related to decay heat removal following a very small break LOCA.

l. For General Electric designed reactors, submit a study of the possible methods of reducing challenges to relief valves including recommendations for reducing challenges.

C. EMERGENCY PREPAREDNESS AND RADIATION EFFECTS

1. UPGRADE EMERGENCY PREPAREDNESS

Provide an emergency response plan in substantial compliance with NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" (which may be modified after May 13, 1980 based on public comments) NRC will give substantial weight to FEMA findings on offsite plans in judging the adequacy against NUREG-0654. Perform an emergency response excercise to test the integrated capability and a major portion of the basic elements existing within emergency preparedness plans and organizations.

2. UPGRADE LICENSEE EMERGENCY SUPPORT FACILITIES

Establish an onsite technical support center separate from, but close to, the control room for engineering and management support of reactor operations during an accident. The center shall be large enough for the necessary utility personnel and five NRC personnel, have direct display or callup of plant parameters and dedicated communications with the control room, the emergency operations center, and the NRC. Provide radiation monitoring and ventilation systems, including particulate and charcoal filters, and otherwise increase the radiation protection to the onsite technical support center to assure that personnel in the center will not receive doses in excess of 5 rem to the whole body or 30 rem to the thyroid for the duration of the accident. Provide direct display of plant safety system parameters and call up display of radiological parameters.

Establish an onsite operational support center, separate from but with communications to the control room for use by operations support personnel during an accident.

Designate a near-site emergency operations facility with communications with the plant to provide evaluation of radiation releases and coordination of all onsite and offsite activities during an accident.

For the near-site emergency operations facility, provide shielding against direct radiation, ventilation isolation capability, dedicated communications with the onsite technical support center and direct display of parameters with emphasis on radiological and meteorological parameters.

3. COMMUNICATIONS

Install direct dedicated telephone lines between each plant and the NRC Operations Center.

4. IMPLEMENTATION OF NRC AND FEMA RESPONSIBILITIES

The applicant emergency plans shall meet the requirements of Appendix E to 10 CFR Part 50, and the criteria in NUREG-0654. Offsite plans shall meet the criteria in NUREG-0654.

5. PRIMARY COOLANT SOURCES OUTSIDE THE CONTAINMENT STRUCTURE

Reduce leakage from systems outside containment that would or could contain highly radioactive fluids during a serious transient or accident to as-low-as-practical levels, measure actual leak rates and establish a program to maintain leakage at as-low-as practical levels and monitor leak rates.

6. OFFSITE DOSE MEASUREMENTS

The NRC will place approximately 50 termoluminescent dosimeters (TLD's) around the site in coordination with the applicant and State environmental monitoring program.

7. INPLANT RADIATION MONITORING

Provide the equipment, training, and procedures to accurately measure the radioiodine concentrations areas within the plant where plant personnel may be present during an accident.

8. CONTROL ROOM HABITABILITY

Identify and evaluate potential hazards in the vicinity of the site as described in Standard Review Plan (SRP) Sections 2.2.1, 2.2.2, and 2.2.3, confirm that operators in the control room are adequately protected from these hazards and the release of radioactive gases as described in SRP Section 6.4 and, if necessary, provide the schedule for modifications to achieve compliance with SRP Section 6.4.

NOTE 1: This requirement has not been approved but has been recommended for approval to the Commission for initiation in FY 80 or FY 81.

Testimony Before The Interior Subcommittee
On Energy and the Environment

U.S. House of Representatives

By

Don M. Shakow

May 27, 1980

My name is Don M. Shakow. I am currently Assistant Professor of Economics at Clark University, Worchester, Massachusetts, and Senior Economist for Energy Systems Research Group, Inc., 120 Milk Street, Boston, Massachusetts. Over the past five years I have done considerable research and have acted often in a consultive capacity in the areas of electric utility systems planning, energy usage and demand forecasting. In addition, I am the originator of the ESRG energy system generation expansion model which calculates for an electrical supply system the optimal generation expansion path over a specified planning period, as well as estimates of the reliability and social cost of any expansion scenario. This model has been employed or is presently being employed in the analysis of utility systems in Michigan, Pennsylvania, Ohio, West Virginia, Missouri and Idaho.

On November 13, 1979 I submitted testimony before the Pennsylvania Public Utility Commission on behalf of the Pennsylvania Office of Consumer Advocate. My testimony concerned an independent analysis of optimal generation expansion plans and reliability criteria for the Philadelphia Electric Company's system and an assessment of the current company planning strategy and its probable impact on customer costs of electricity. This testimony addressed more particularly alternatives to the completion of the Limerick nuclear plant and associated impacts for ratepayers.

On April 16 of this year I was invited to testify before you this morning on the issue of Limerick. In the testimony which I have referred to above, I concluded that the present construction program of the Philadelphia Electric Company is likely to engender costs to consumers which are excessive, relative to rates under an alternative program. This alternative program would require five new, intermediate sized coal units of 300 megawatts each.

Under this program, construction of the two Limerick units totaling 2100 megawatts appears problematic. Construction of the latter unit in particular seems ill-advised. I also concluded that the reserve margins of 27-28% being advocated by the Company for the 1980's are excessive and are, moreover, not required to ensure reliable service. To achieve a partial blackout reliability of less than one day in ten years by 1987, reserve margins of 14-22% are likely to be adequate.

Today, rather than discussing the precise cost estimates for the Philadelphia Electric Company construction program which I derived through the application of the ESRG model, I would like to address some more generic issues which arise time and again in the course of my analysis of generation systems. In particular, the planning practices of the Philadelphia Electric Company show a number of methodological biases which are common to other utilities as well. In consequence, the application of optimization codes by utilities and the presence of these biases yield results which are generally favorable to large baseload generation and to nuclear generation in particular. I would submit that the consumer interest dictates a need for greater awareness of and vigilance toward these methodological practices. The methodological biases which are referred to include the following:

1. The imputation of nuclear fixed costs on the basis of architect/engineering studies, as opposed to historical analyses.

2. The specification of reserve margins on the basis of arbitrary probabalistic criteria which do not account for the economic trade-offs between energy unserved and excessive capacity.
3. The tendency to confound considerations of reliability and cost optimization, which leads in turn to the misapplication of older baseload plants.
4. The presumptory assumption of regulatory practices favorable to investor interests; as a consequence a misassessment of social costs associated with the cancellation of facilities presently under construction.

Allow me to elaborate on each of these issues in turn.

Nuclear Cost Estimates

Recent revisions in the assessment of nuclear cost by technical experts have greatly altered the economics of nuclear plants in comparison to alternatives. Nonetheless many utilities, in their planning, persist in using outmoded estimates. The Philadelphia Electric Company provides a typical instance of a utility using such estimates. More particularly, earlier cost estimates were undertaken by architect/engineering firms chiefly from the standpoint of idealized plant designs, without accounting for the historical experience of facilities currently in operation. It was tacitly assumed that after an initial "shakedown" period in which costs were incurred due to the novelty of the technology, the construction and licensing would become more systematized. Actual costs as a consequence were then expected to approach theoretical design based estimates. On the contrary, nuclear capital costs have continued to escalate and no end to the "shakedown" phase appears in evidence.

Table 1 provides evidence of the disparity between architect/engineering studies of nuclear cost and historically based costs. Utilizing statistically based estimates, the nuclear alternative appears less favorable relative to coal and other baseload technology.

The Use of Probabalistic Reliability Criteria

A large number of utilities, including the Philadelphia Electric Company, established reliability criteria for their systems *a priori*, without accounting for the economic costs and benefits of these criteria. The most widespread is the one-day-in-ten-years criterion which specifies that capacity plus imports should be unavailable to meet system requirements on an average, of no more than one day in ten years. The origins of this parameter are shrouded in mystery. Little justification is generally provided for its use other than hortatory statements on the need to avoid blackouts.

While blackouts impose substantial costs on society, it is necessary to appreciate that the excessive construction of power generating facilities is also costly and that these latter costs are frequently borne by those least able to afford them. What is required is an explicit comparison of blackout costs with costs of additional capacity.

In my study of the Philadelphia Electric Company, the application of a social costs rather than a loss-of-load probability criterion resulted in a choice of a reserve margin 10 percentage points lower than that projected by the Company. More important still is the observation that, in light of my use of social cost reliability criterion, the cost assumptions associated with unserved energy were made explicit; the cost of averting blackouts, voltage reductions and load curtailments were specified directly. My choice of a reserve margin was open, therefore, to criticism and further analysis. A comparable economic analysis of the Company's reserve margin would present great difficulty.

Cost Optimization v. Reliability

The common plea among utilities is that nuclear power plants and other large power facilities should be built in order to avert the possibility of future shortfall. However, the association between nuclear plants and system reliability is highly misleading. Table 2, taken from our recent testimony before the Pennsylvania PUC, indicates that the choice among alternative baseload plants is largely unconnected to the reliability issue, but concerns only the question of relative costs. As the reserve margin for the Philadelphia Electric Company is increased and the system becomes more reliable, the model introduces more peaking facilities into the mix. Such facilities require very modest initial expenditures, but are expensive to operate (especially in light of escalating oil costs). However, the high operating cost imposes only a modest cost penalty overall since the plants are utilized only at times of unusually high demand--perhaps only 200 to 500 hours a year. These peaking plants are thus able to ensure reliable service at modest costs.

It should be noted, moreover, that the present Philadelphia Electric Company mix contains a large number of peaking units and that the construction of additional units of this type are, for the most part, uncalled for. I conclude, therefore, that the Limerick facilities cannot be justified on the basis of reliability. Moreover, as I have indicated above, a cost comparison of Limerick relative to alternative baseload technologies, appears unfavorable to Limerick. I've recommended therefore that the Limerick units be reconsidered.

Regulatory Practice

The potential slippage, cancellation and/or suspension of large, multi-billion dollar generation facilities is unprecedented in the history of the electric utility industry. These possiblities impose serious problems for regulatory agencies. In particular, the question arises as to who pays the costs incurred by cancelled power plants. It can be argued that utilities are responsible to the public for their planning practices, many of which are extremely complex technically and hence opaque, except to the trained observer. When the cancellation of a facility presently under construction is due at least in part to miscalculations in the utility planning process, it is reasonable to impute a fraction of the cost of cancellation to the utility.

At present, utilities in their planning do not allow for this possibility. They assume, in fact, that the ratepayers will incur all costs associated with cancelled facilities. As a consequence, the social costs of completing facilities such as the two Limerick units are estimated as equal to the incremental costs of these plants, that is, to the sums which are yet to be expended prior to completion. Were the costs of the cancelled plants imputed to the company, the costs to consumers of completing the plants would equal the full rather than the incremental costs of the plant.

The planning consequences of using incremental rather than full cost assumptions can be substantial. In my analysis of the Philadelphia Electric Company, I found that based on the company's assumptions as to nuclear capital costs, the imputation of full rather than incremental cost would imply the selection of intermediate coal facilities in preference to the Limerick units (Table 3). The assumption of favorable regulatory treatment and the inclusion of the Limerick units within the plant mix appears thus to be mutually reinforcing.

Aside from these instances of technical bias, I and my colleagues have come across cases of more flagrant bias-cases which I might note do not involve the Philadelphia Electric Company. My colleague, Dr. Richard Rosen has found that a group of utilities in Western Pennsylvania and Ohio selected a generation weighted toward nuclear, despite the fact that their own calculations showed a coal-weighted mix was relatively lower in cost. I and my colleague Dr. Dennis Duscik of Clark University discovered a similar result in examining certain long range planning documents of the New England utilities. I mention these instances of planning bias not so much to call into question the wisdom of continuing the construction of the Limerick units but rather to observe the question of planning bias more generally.

At present the average citizen and ratepayer has little access to or control over planning decisions which involve billions of dollars and which affect him subsequently in the form of escalating electricity rates. Such planning decisions, in my opinion, reveal systematic flaws which are in principle subject to formal criticism and redress. The elimination of these flaws would require fundamental changes in existing planning practices as regards electricity supply and a particular change in the level and quality of public sector participation in electrical system planning practices. In my judgment, an exploration of possible reform in this area is overdue.

DMS/g

TABLE I

PLANNING ESTIMATES OF NOMINAL COST PER KW OF NUCLEAR FACILITIES
(Mixed Current Dollars)

Architect-Engineering Studies: (1990 in-service date)

Bechtel*	$1482
Ebasco*	1780
Sargent & Lundy*	1777
Stone & Webster*	1937
NRC**	1320
PECO***	1478

Historical Analyses: (1988 in-service date)

Mooz[†]	$2414/3364
Perl[†]	1653
Komanoff*	2309
PASNY[†]	2580
ESRG[†]	2887
California Energy Commission[†]	3668

SOURCES:

* Westinghouse Corporation, Nuclear and Coal Power Generation Economics, 6/79, pp. 2-4.

** NRC, "Coal and Nuclear: A Comparison of Cost of Generating Baseload Electricity" by Hegin, 12/78, p.25.

*** Philadelphia Electric Co., Prepared testimony of Emil Kazum (1979), p. 18.

† Refer to Table 23 below, p. 95.

TABLE 2

INCLUSION OF SELECTED PLANTS IN THE 1990 OPTIMAL PLANT MIX* AS A FUNCTION OF RESERVE MARGIN

("YES" indicates that the plant enters the optimal mix at the specified reserve; "NO" indicates that the plant is excluded from that mix.)

	Plant	Rated Capacity (MW)	RESERVE 6%	MARGIN 14%	22%	30%
PEAKERS	CROMB2	183	NO	NO	NO	YES
	Salem 3	16	NO	NO	YES	YES
	Rich 91	51	NO	YES	YES	YES
BASELOAD	Eddystone 1	381	YES	YES	YES	YES
	Eddystone 2	311	YES	YES	YES	YES
	Limerick 1	1055	NO	NO	NO	NO
	Limerick 2	1055	NO	NO	NO	NO
	Generic Coal	300	YES	YES	YES	YES
	Generic Nuclear	1200	NO	NO	NO	NO

* Based on ESRG load Forecast and ESRG-LOW plant cost Forecast.

TABLE 3

OPTIMAL 1992 BASELOAD PLANT CONFIGURATION UNDER ALTERNATIVE ASSUMPTIONS

Case #	Load Growth	Plant Cost	Capital Cost	Optimal New Capacity	Optimal Reserve Margin (Approximate Rar
1	PECO	PECO	Full	2400 Mw, Coal*	14 - 22%
2†	PECO	PECO	Incremental	Limerick #1 Limerick #2 600 Mw, Coal	30%
3	PECO	ESRG-HIGH	Full	1500 Mw, Coal	14 - 22%
4	ESRG	ESRG-LOW	Full	600 Mw, Coal	14 - 22%
5	PECO	ESRG-LOW	Full	1500 Mw, Coal	14 - 22%
6	PECO	ESRG-LOW	Incremental	1500 Mw, Coal	14 - 22%
7††	ESRG	ESRG-LOW	Incremental	600 Mw, Coal	14 - 22%
8	ESRG	PECO	Incremental	Limerick #1 Limerick #2	30%

Source: ESRG Model

* All coal units listed in this column are 300 Mw units.

† PECO Planning Case

†† Base Case

COUNTY OF MONTGOMERY

OFFICE OF EMERGENCY PREPAREDNESS AND MEDICAL SERVICES

100 WILSON BLVD.
EAGLEVILLE, PA. 19403

DIRECTOR
SAMUEL L. ELY, III

OEP 215-631-5100
EMS 215-631-5103

May 22, 1980

Congressman Peter H. Kostmayer
8th District, Pennsylvania
Congress of the United States
House of Representatives
Washington, D.C. 20515

Dear Congressman Kostmayer:

In your letter of May 14, 1980, you have requested the answers to five questions.

1. I am the Director of Emergency Preparedness in Montgomery County. The population is approximately 650,000. We have a general emergency plan entitled, "Montgomery County Disaster Plan and Standard Operations". This plan does address itself to radiological emergencies.
2. The department has four active emergency planners but has the use of the County planning commission and many other County departments are able to supply statistics and other planning material.
3. We have been contacted by the Federal Emergency Management Agency (FEMA) and the NRC regarding the nuclear plant. We also have been a part of four meetings with the state and Pennsylvania Emergency Management Agency (PEMA) and the Philadelphia Electric Company regarding preliminary planning at the Limerick Nuclear facility.
4. You requested my professional qualifications. I have enclosed a sample of the same.
5. We presently have five Radiological Defense Officers. These officers have been sent to the staff college in Battle Creek, Michigan for their training. We have approximately 150 Radiological Monitors. We also have the availability and the use of physicists from Montgomery County Community College, Ursinus College, and the Penn State Ogontz Campus.

PHONE: 24 HOUR SERVICE • EMERGENCY PREPAREDNESS 631-5100

Your question on the treatment on the radiation sickness I would have to defer to the Department of Health-Harrisburg, DER-Norristown, and NRC-King of Prussia.

We have, in addition, written plans and established resource manuals for fire, police, ambulances, as well as inventoring the school system for shelters and the use of these 200 plus schools in time of emergencies. We also have use of the school buses and 85 ambulances available through Ambulance Rescue Association.

We have contacted the funeral directors and have the use of their vehicles in the event that our ambulance system would become overloaded. Mr. Lewis Louderback of Louderback North American, has generously offered the services of his moving vans to supplement the people moving capable of non-ambulatory persons during emergencies. If I can be of further help on this subject, please let me know.

In summary, this plan must be a cooperative venture of Federal, State, County, and Local Government. I would think a plan by now has been developed by the federal people that can cover the details needed for a Nuclear Plant Accident. That plan should be able to be amended to cover different terrain and population this would give us a sound base to start with. It is important to know who will do what from the state and federal level such as, traffic control, State Police?, Looting, National Guard?. Who addresses the nuclear medicine problem sickness and burns? We the local and county governments look for directions and guidance from you. We were told at a recent NRC meeting in New York, that $90 million was allocated to planning in the 40 states with Nuclear Plants; some of this money hopefully will go to our level for planning. The Federal Plan and our local input should be an equal partnership with no blind spots.

Sincerely,

Samuel L. Ely, III
Director

SLE/cmb

Enclosure

COUNTY OF BUCKS

EMERGENCY SERVICES

Administration Building, Room 107, Doylestown, Pa 18901 — 215-345-9043

ANDREW L. WARREN, Chairman
ELAINE P. ZETTICK
CARL F. FONASH

Charles L. McGill
Director

MAY 2[illegible]

May 22, 1980

Representative Peter H. Kostmayer
Congress of the United States
House of Representatives
Washington, D. C.

Dear Peter:

In response to your letter of May 14, 1980 relative to planning for response to an emergency involving release of radio active materials, the following remarks are in numerical order corresponding to your letter.

1. Bucks County has an emergency operations plan supported by standard operating procedures. The plan was revised and updated and has State approval as of April, 1980.

2. The Emergency Management Agency has two professional employees and clerical support. Two persons are responsible for planning. Two trained volunteers in radiation effects are immediately available. There are approximately two hundred volunteers trained in radiation detection.

3. There has been discussions with State officials with references to the Limerick Plant. We have received no specific directives at this time. We know they are coming and we know our area of responsibility. We have had no direct contact from Federal or Utility officials.

4. The writer is the Director of the Emergency Management Agency and is supported by an Emergency Management Executive full time, an experienced executive volunteer. (A full time professional, retired May 1, 1980). The two executives have received extensive training via the State and Federal Civil Defense organizations in

radiation detection, monitoring and radiation effects. The Director's training in this area is less than the Executive, but still extensive. The Director has had eighteen years of experience in disaster planning and response. The combined experience of the two present Emergency Management personnel is twenty two years. Adding the experience of the recently retired volunteer, there is a total of thirty six years of disaster planning and response available to Bucks County.

5. There are presently about one hundred radiation monitoring stations established in Bucks County. Two trained monitors and detection equipment to each station. Reporting is to the County Emergency Management Agency, then to the eastern area office of the State Emergency Management Agency in accordance with established protocol. State teletype warning and communication system is used. Under emergency conditions, six persons trained to the level of Radiological Defense Officers are available to provide crash programs in Radiation Detection (Eighteen hour course). Fifty sets of radiation detection equipment are available for distribution to trained personnel to support the detection efforts. Direct contact to the two County radio stations as well as stations in Lansdale, Trenton and Philadelphia can be used to disseminate information and instructions. The treatment of contaminated persons by County hospitals is understood and can be accomplished. Long term treatment of "Radiation Sickness" can be adequately handled by all of the seven County hospitals.

Yours truly,

Charles L. McGill

CLMcG/bgp

COMMONWEALTH OF PENNSYLVANIA EMERGENCY PREPAREDNESS AND RESPONSE

Presented by Oran K. Henderson, Director
Pennsylvania Emergency Management Agency

Introduction

This paper discusses the Commonwealth of Pennsylvania's emergency response mechanism and legal basis in being at the time of the Three Mile Island incident. It recounts some of the problems and experiences accruing from Three Mile Island. Finally, it presents the status of State and county planning.

I am not taking sides in the debate about our need for nuclear energy or how easily we can do without it. It is sufficient to say that many knowledgeable people argue that this Country's use of nuclear power to meet a small portion of its energy needs cannot be eliminated without very serious and damaging economic consequences. During the past year, small percentage reductions of imported oil have reminded us of this fact. It is, therefore, reasonable to assume that we will continue to utilize nuclear power to generate nuclear energy and may be more dependent upon it in the future. Logic dictates that if we must have it, then we should try: (1) To minimize its risks; and (2) to be prepared to meet the consequences should all else fail.

Pennsylvania Emergency Management Agency

The Pennsylvania Emergency Management Agency functions as a semi-independent Agency under the Office of the Governor.

It is the organization through which the Governor exercises his emergency responsibility for the protection of the health, safety and well being of Commonwealth citizens faced with disaster from either manmade, natural or enemy attack causes. The Pennsylvania Act for emergency preparedness and response is patterned after the model Act developed by the Council of State Governments. Many of the states have used the model Act as a guide, modifying it as necessary to meet special needs and to accommodate respective organizational arrangements.

The Act designates a Council arrangement and prescribes its membership. The Council, chaired by the Lieutenant Governor, is responsible for developing overall policy and providing guidance to the Agency. The Council membership includes the Governor, Lieutenant Governor, four members of the State Senate and House and ten Secretaries of Departments having major emergency responsibilities.

The law prohibits the Pennsylvania Emergency Management Agency from duplicating the functions of any other State agency. Consequently, the Pennsylvania Emergency Management Agency task is that of maintaining close liaison with all State agencies, determining gaps in missions and roles, developing integrated plans to assure continuing identification of State resources and the prompt assignment of these resources towards reducing the vulnerability of people involved in emergencies.

In the conduct of emergency operations, the Pennsylvania Emergency Management Agency Emergency Operations Center and its three Area centers are augmented, at times of disaster, with representatives from those State agencies having an emergency role. These representatives are given the authority to perform in behalf of their respective departments and agencies and commit resources in accordance with predeveloped procedures.

The Pennsylvania Emergency Management Agency's day-to-day role is one of analyzing problem areas and vulnerabilities, planning for all eventualities and the training of staff and County Coordinators. Quarterly exercises are conducted with the Pennsylvania Emergency Management Agency and agency response team members to assure the maintenance of understanding and knowledge of the Agency's Standing Operating Procedures.

The Pennsylvania Emergency Management Agency Emergency Operations Center is located in an underground, protected facility in the Capitol complex in Harrisburg. Three Area underground and protected facilities are strategically located to extend the Pennsylvania Emergency Management Agency coordination and management role.

The Harrisburg Emergency Operations Center is in communication with its three Area Emergency Operations Centers by telephone, radio and a dedicated teletypewriter system.

Each political subdivision is required by law to have an emergency management organization. The Commonwealth has a total of 2,636 political subdivisions (67 counties, 52 cities, 966 boroughs/town and 1,551 townships). Each Emergency Management Coordinator is appointed to his/her post by the Governor, based upon recommendations of the elected heads of government of the political subdivision. Information flows from boroughs, towns and cities to county, then to Area to State and vice versa.

Within the Commonwealth, there are four fixed nuclear sites. Two additional sites are under construction and scheduled for activation in 1982 (Berwick) and 1985 (Limerick).

Planning for Commonwealth response to an emergency nuclear incident at a fixed site has, in the past, been the responsibility of the Bureau of Radiation Protection, Department of Environmental Resources. In 1975, the Bureau of Radiation Protection forwarded its plan to the Nuclear Regulatory Commission for concurrence. The Nuclear Regulatory Commission did not concur in this plan. The plan was revised in September 1977, however, was not formally submitted to the Nuclear Regulatory Commission. The 1977 plan provided the basis for the Pennsylvania Emergency Management Agency's issuing an Annex "Nuclear Incidents, Fixed Facility", to the Pennsylvania Disaster Operations Plan, which provided guidance to State agencies and political subdivisions. All planning was based upon a five mile protective action distance. County plans in support of the State Disaster Operations Plan were "in place" and had been reviewed and updated during the summer and fall of 1978.

The Pennsylvania Emergency Management Agency experiences during the Three Mile Island incident were in many respects similar to those encountered in previous natural disaster events and differed primarily in degree or magnitude. The single exception is perhaps the people's perception of a danger (aura of mystery) that cannot be seen, felt, smelled or tasted, resulted in an attitude not generally shared in other emergency responses. The Pennsylvania Emergency Management Agency was required to convey an attitude of restraint and caution during a possible catastrophe to the general public. These are some of the lessons learned.

We can no longer take for granted that nuclear power plants are safe. Our planning should not treat as merely an extremely remote possibility.

We need to obtain and plan for the use and dissemination of potassium iodide.

We need to increase our attention to the handling of people under special care in homes, hospitals and institutions.

We need to improve the educational level of all segments of the public as it pertains to nuclear radiation.

We need a fully integrated and adequately redundant warning and communications system in-place.

We must do a better job of bringing county and local government officials into the decision making process.

We must recognize emergency management's dependency upon volunteers and volunteer forces and understand they may not always be available.

We must improve our capacity for handling the news media and assuring their continuing support for the dissemination of factual information.

We must develop a more formalized system for tests and exercises.

Our planning effort must assure total integration at all levels of government and between these levels of government.

We need a national level plan that identifies resources and tasks Federal agencies.

We need to standardize procedures for the systematic study of the social, economic and health aspects of an accident.

We need to improve our record keeping.

And, finally, we need to seek and pursue solutions to the problems associated with fixed nuclear power facilities as a matter of urgency--not on the emotionally-charged rhetoric of the moment but upon dispassionate, reasoned analysis.

Subsequent to TMI, the NRC revised its guidelines based upon the acceptance of the criteria in NUREG 0396, December 1978, which defined emergency planning zones to be an approximate ten-mile radius from each nuclear facility and for an ingestion area of approximately 50 miles around each nuclear facility. In addition, the publication of NUREG 0654, January 1980, provided supplemental interim draft guidance for nuclear emergency response planning. Based upon this Federal guidance, the State and counties, in conjunction with nuclear operational facilities, initiated revisions to their planning. For the State, this meant revising Annex E, "Fixed Nuclear Facility Incidents", of the Commonwealth Disaster Operations Plan. The planning effort consisted of a team approach between State, State agencies, facilities and counties, to be sure that there was a coordination in the efforts towards continuity of operations from facilities to all off-site response mechanisms. Our greatest concern is the evolving guidance is too detailed and requires the inclusion of procedures as an integral part of the plans.

Federal assistance to State efforts in the revision of State planning to comply with new Federal guidelines consisted of staff visits and on-the-spot review of the planning effort rather than any defined financial and personnel assistance to support the program. The exception being the State has been authorized to temporarily divert the Federally funded Nuclear Civil Protection effort from the previous objectives to that of assisting the State in meeting its planning objectives and schedules as pertains to fixed nuclear facilities.

The status of the State and county planning effort is that the revised Annex E to the Commonwealth Disaster Operations Plan "Fixed Nuclear Facility Incidents", has been submitted to the Federal/Regional Advisory Committee (RAC) for review against the Federal planning guidelines in NUREG 0654. The county planning effort has been directed on a priority basis towards those operational fixed nuclear facilities in the State to be followed by the proposed two new nuclear facilities. The priority of county planning being those counties around TMI, then Peach Bottom, Beaver Valley, Susquehanna, and lastly, Limerick. Most of the effort for Limerick is still in its initial stages involving NRC and the facility.

We anticipate because the operational date of Limerick is presently 1985 that we will be able to apply the lessons learned in our planning effort for the three operational facilities in the State toward that of Susquehanna and Limerick. In this connection, it must be understood that the counties involved in Limerick have complied with the statute requirement that the county maintain emergency management plans for all emergencies. The county emergency management plan for nuclear incidents being developed will be a sophisticated supplement to the county plan based upon the State Plan and Federal guidelines.

STATEMENT OF
JOHN W. McCONNELL
ASSISTANT ASSOCIATE DIRECTOR

FEDERAL EMERGENCY MANAGEMENT AGENCY.

MAY 27, 1980

before the

House Interior and Insular Affairs
Subcommittee on Energy and the
Environment

Newtown, Pennsylvania

Mr. Chairman, Ladies and Gentlemen:

I welcome the opportunity to be with you today to share ideas in the vital field of radiological emergency preparedness. By cross-fertilizing ideas at conferences such as this, we should be able to improve our management of resources needed to prepare for all kinds of emergencies which we may face in the future.

That is the serious business of the Federal Emergency Management Agency -- dealing with major crises of all kinds. To meet this responsibility -- and challenge -- we are evolving a method of operation, which we call comprehensive emergency management.

By use of this technique we are able to bring to bear a great deal of experience and expertise on specific requirements such as preparing for potential emergencies involving nuclear plants.

Comprehensive emergency management provides a mutual reinforcement of a variety of emergency management activities which results in the whole being greater than the sum of its parts.

It's the multi-use of resources at all levels of government, carried out without legal or organizational impairment to take advantage of similarities in planning and response activities for peacetime and even nuclear attack emergencies. It can mean radiological monitoring teams trained for war-related emergencies being available also to monitor and report any accidental peacetime release of radiation.

Comprehensive emergency management will also provide an improved basis for determining relative benefits and cost effectiveness of spending for hazard mitigation, preparedness planning, relief operations and recovery assistance.

Comprehensive emergency management clearly encompasses an accident at a commercial nuclear power plant site.

History of the Program

In the early 1970's, the Atomic Energy Commission was directed to provide planning assistance to State and local governments for the preparation of radiological emergency response plans. Since Federal law does not require States or local governments to have peacetime nuclear emergency plans, nor does it require States with plans to test those plans, acceptance of this assistance was, of course, entirely at the discretion of the States. The AEC thus implemented an essentially voluntary program of planning and assistance to States.

On December 24, 1975, the lead agency responsibility for "reviewing and concurring on State radiological emergency response plans," was assigned to the Nuclear Regulatory Commission and the planning assistance was expanded to include transportation of radioactive materials.

The Accident at Three Mile

The accident at the Three Mile Island nuclear power plant caused a major rethinking of the whole area of emergency plans and preparedness by NRC and other authorities.

Two weeks after the accident, the President established a Presidential Commission on the accident.

The Commission made a number of recommendations regarding emergency preparedness, which are summarized as follows:

> The [Kemeny] Commission found that at all levels of government, planning for the off-site consequences of radiological emergencies lacked coordination and urgency. Their recommendations call for significant change: an

improved state response plan is a requisite for granting an operating license (F.1); FEMA should have the lead responsibility, in consultation with NRC and other appropriate agencies, for radiological emergency planning (F.1); emergency response plans should be based on various classes of accidents and local communities should have funds and technical assistance for local planning (F.2); research on medical means of mitigating radiation effects should be expanded (F.3); a program is needed to educate the public on nuclear plant operation, health effects from radiation and protective actions against radiation (F.4); further study on mass evacuation is necessary (F.5); and plans for providing Federal emergency support should be revised to assure improved coordination and more effective capabilities (F.6).

On December 7, 1979, in response to the Kemeny Commission recommendations, the President announced, in part, a series of decisions and recommendations in the areas of emergency planning and preparedness. He assigned FEMA responsibility to head up "all off-site emergency activities and to complete a thorough review of emergency plans in all the States of our country with operating nuclear reactors by June 1980." FEMA was directed to undertake a number of functions, including:

(1) Take the lead in offsite emergency planning and response;
(2) Complete by June 1980, the review of State emergency plans in those States with operating reactors;
(3) Complete as soon as possible the review of State emergency plans in those States with plants scheduled

for operation in the near future;

(4) Develop and issue an updated series of interagency assignments which would delineate respective agency capabilities and responspbilities and clearly define procedures for coordination and direction for both emergency planning and response;

(5) Assure the development of programs to address the recommendations for additional research and public education needs.

In addition, the President urged:

- That NRC assist FEMA in these activities;
- That State and local officials work with FEMA to assure the necessary coordination of their respective emergency responsibilities;
- That FEMA provide States with technical assistance wherever appropriate.

FEMA/NRC Memorandum of Understanding (MOU)

To implement the President's assignment, NRC and FEMA on January 14, 1980, signed a Memorandum of Understanding (MOU) describing each agency's responsibilities in preparing for emergencies at commercial nuclear plants.

The agreement applies to emergency preparedness for "all commercial nuclear power plants, certain nuclear fuel cycle facilities, and nuclear materials licensees whose operations have a potential for significant accidental off-site releases of radiation." For the first six months, however, the parties intended that the emphasis be placed on emergency preparedness at commercial nuclear power plants.

The MOU acknowledged that FEMA would perform the functions outlined in the President's December 7 statement.

NRC's responsibilities under the agreement are to:

(1) Assess the adequacy of licensees' emergency plans;

(2) Verify that licensees' emergency plans are adequately implemented;

(3) Review the FEMA determinations on the adequacy of State and local plans; and

(4) Make decisions on the overall state of emergency preparedness in connection with the issuance of operating licenses or the shutdown of operating reactors.

FEMA and NRC also agreed to cooperate in certain other areas: FEMA will provide on request a letter evaluation of the adequacy of State and local emergency plans to be used in connection with NRC licensing reviews for reactors, fuel facilities and nuclear materials licensees. In addition, FEMA agreed to give NRC an independent assessment of evacuation times around 12 reactor sites. The two agencies agreed to discuss future arrangements for similar assessments to be performed at other reactor sites.

New Criteria Document

In January 1980, NRC and FEMA jointly issued an interim document entitled: Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.

The purpose of this interim guidance and upgraded acceptance criteria is to provide a basis for NRC licensees, State and local governments to develop radiological emergency plans and improve emergency preparedness associated with commercial nuclear power plants. The document combines the guidance to State and local governments with that which applies as a matter of regulation to the licensees of NRC and superseded previous guidance and criteria published by FEMA and NRC. It is intended for use by reviewers in determining the adequacy of State, local and nuclear power plant operator emergency plans and preparedness. The document contains a series of sixteen detailed planning objectives and a listing of specific items of guidance to State and local governments as well as specific requirements concerning planning and preparedness activities of the licensees of NRC.

(1) Assignment of responsibility (organization control). To assure that primary responsibilities for emergency response in nuclear facility operator, State and local organizations within the Emergency Planning Zones have been assigned, that the emergency responsibilities of the various supporting organizations have been specifically established, and that each principal response organization is staffed to respond and to augment its initial response on a continuous basis.

(2) Emergency Response Support and Resources. To assure that arrangements for requesting and effectively using assistance resources have been made, and that other organizations capable of augmenting the planned response have been identified.

(3) Emergency Classification System. To assure that a standard emergency classification and action level scheme is in use by the nuclear

facility operator, including facility system and effluent parameters; and to assure that State and local response organizations will rely on information provided by facility operators for determinations of initial off-site response measures.

(4) Notification Methods and Procedures. To assure that procedures have been established for notification, by the facility, of State and local response organizations and for notification of emergency personnel by all response organizations; to assure that the content of initial and followup messages to response organizations and the public have been established; and to assure that means to provide early warning and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.

(5) Emergency communications. To assure that provisions exist for prompt communications among principal response organizations, to emergency personnel and to the public.

(6) Public information. To assure that accurate and timely information is provided to the public on how they will be notified and what their initial actions should be; to assure that the principal points of contact with the news media for dissemination of information (including physical location or locations) are established in advance; and to establish procedures for coordinated dissemination of information to the public.

(7) Emergency facilities and equipment. To assure that there are adequate emergency facilities and equipment to support the response.

(8) Accident assessment. To assure that adequacy of methods, systems and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency.

(9) Protective response. To assure that a range of protective actions is available for the plume exposure pathway for emergency workers and the public; that guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in use, and that protective actions for the ingestion exposure pathway appropriate to the location have been developed.

(10) Radiological exposure control. To assure that means for controlling radiological exposures in an emergency are established for emergency workers and the affected population.

(11) Medical and public health support. To assure that arrangements are made for medical services for contaminated invididuals.

(12) Recovery and reentry planning and postaccident Operations. To assure that general plans for recovery and reentry are developed.

(13) Exercises and drills. To assure that periodic exercises are conducted to evaluate major portions of emergency response capabilities, that the results of exercises form the basis for corrective actions for identified deficiencies and that periodic drills are conducted to develop and maintain key skills.

(14) Radiological emergency response training. To assure that radiological emergency response training is provided to those who may be called upon to assist in an emergency.

(15) Responsibility for the planning effort: development, periodic review and distribution of emergency plans. To assure that responsibilities for plan development, review and distribution of emergency plans are established and that planners are properly trained.

The public comment period for this interim document ended May 13, 1980.

FEMA Headquarters Organization

In February 1980, FEMA created a new division within its Office of Population Preparedness. This division is responsible for the conduct of the FEMA radiological emergency preparedness effort. The new division:

- Develops guidance for the preparation of State and local off-site radiological emergency response plans and preparedness.
- Reviews and assesses State and local off-site radiological emergency response plans and preparedness.
- Develops guidance for training of State and local officials for response to radiological emergencies.
- Assists in the development of the National Plan for dealing with radiological emergency response and preparedness.
- Develops guidance on preparation, conduct, and evaluation of drills and exercises by State and local radiological emergency response organizations, and evaluates and assesses these drills and exercises.
- Monitors status of planning, training and overall capabilities of State and local governments for radiological emergency response.
- Provides guidance to the Regional Assistance Committees and monitors their activities.
- Assists in any proposed rule making related to off-site emergency preparedness for fixed nuclear facilities.
- Coordinates, through the Federal Interagency Central Coordinating Committee on Radiological Emergency Response Planning, the activities of other Federal departments and agencies involved in the radiological

emergency response planning program.

- o Assists in the development of the FEMA education and public information programs.
- o Monitors FEMA and other Federal agency activities in the area of research and development for radiological emergency planning and response.

Current Status of the NRC Voluntary Program for Reviewing and Concurring in State Plans

In March 1980, the NRC formally renounced the voluntary concurrence program which it had previously obtained concerning State and local government plans and preparedness. NRC staff made the following points in a letter to FEMA dated March 13, 1980:

> * The lead for review of the adequacy of off-site emergency plans and their capability of implementation has been transferred to FEMA. This is reflected in the NRC/FEMA Memorandum of Understanding dated January 14, 1980, in accordance with the President's Statement of December 7, 1979. Consequently, there is no longer an NRC voluntary concurrence program for State emergency plans. (Emphasis supplied.)
>
> * FEMA has indicated that it will review and make findings and determinations regarding the adequacy of off-site preparedness using the new criteria developed jointly by FEMA and NRC. FEMA will provide the results of such reviews to NRC.
>
> * NRC retains overall responsibility for making licensing decisions, in determining whether licenses should be issued or operations suspended. NRC expects to evaluate deficiencies identified by FEMA to ascertain whether those deficiencies are significant and where they are significant, determine whether compensatory measures have

have been or will be taken by the licensee.

The nature of any future NRC concurrence program for off-site plans will depend on the outcome of pending Federal legislation and the NRC rulemaking process on emergency preparedness.

The Final Proposed NRC Rule previously identified as 10 CFR Part 50 and part 70 is in the final stages of consideration and approval by the Commission. It is planned that the FEMA Rule describing policy and procedures for assistance to the States and review and approval of State and local off-site emergency plans will be consistent with and will be issued on a parallel track with the NRC rule. A critical element to both rules will be the revised and firm criteria against which plans and preparedness measures will be judged.

There is a great deal of activity going on within all the States with nuclear power facilities and in Pennsylvania in particular. I am sure that you will be anxious to hear from Colonel Henderson concerning his progress and future goals and the way our Regional Office staff is working with the State.

By working together, helping each other, and with an understanding and tolerance of each other's limitations, we feel that we can overcome many very difficult problems.

Thank you.

United States House of Representatives

Committee on Interior and Insular Affairs

Subcommittee on Energy and the Environment

May 27, 1980

Statement of Vincent S. Boyer
Senior Vice President, Nuclear Power
Philadelphia Electric Company

My name is Vincent S. Boyer and I am Senior Vice President, Nuclear Power, Philadelphia Electric Company. I am pleased to appear on behalf of the Company in response to Chairman Udall's letter of April 16, 1980 to the Company inviting our appearance at this hearing to testify concerning certain aspects of our Limerick Generating Station.

Before addressing the subjects mentioned in Chairman Udall's letter, I would like to review very briefly the Company's background and experience in the use of nuclear energy for the generation of electricity.

In 1958, in response to invitations from the Federal government to industry to participate in the development of nuclear energy for the generation of electricity, Philadelphia Electric Company, supported by fifty-two other electric utilities, submitted a proposal for the construction and operation of the world's first high-temperature, helium-cooled reactor. Following approval of the proposal by the Joint Committee on Atomic Energy and the Atomic Energy Commission, the plant, now known as Peach Bottom No. 1, was constructed and successfully operated for a period of seven years. It was retired in 1975, having successfully fulfilled its role as a prototype reactor.

In 1974, following the appropriate regulatory approvals, we placed in operation Units 2 and 3 at Peach Bottom. These units, owned jointly with Public Service Electric and Gas Company, Delmarva Power and Light Company, and Atlantic City Electric Company, use boiling water reactors and have been providing reliable, low-cost energy for our customers. Together with the three other utilities just mentioned, we are also joint owners of Salem Units 1 and 2. These units, which employ pressurized water reactors, are located in Salem County, New Jersey and operated by Public Service Electric and Gas Company.

In 1970, Philadelphia Electric applied to the Atomic Energy Commission for authorization to construct the Limerick Generating Station, employing two 1050 Mw boiling water reactor units. The basic plant design for Limerick is similar to Peach Bottom Units 2 and 3 with numerous modifications in recognition of the higher population density of the site. Bechtel Power Corporation, which designed and constructed Peach Bottom Units 2 and 3, has the same role for the Limerick plant. Construction permits were issued by the AEC in June, 1974 and the units have been under construction since that date. We anticipate filing our application with the NRC for operating licenses around the end of 1980. The plant is presently 52% complete overall with Unit 1 over 60% complete and Unit 2 over 35% complete.

As in the case of the Peach Bottom units, we expect that the Limerick units will bring our customers cheaper electricity than would be the case without Limerick. The operation of Peach Bottom Units 2 and 3 has significantly reduced our customers' electric bills. In 1979 alone, the operation of Peach Bottom reduced customers' electric bills by $115,000,000. An average residential customer (500 KWH per month) saved about $2 per month or $24 over the year. Since Peach Bottom went into operation in 1974, Philadelphia Electric Company's customers have saved about $225,000,000 in their electric bills. Its performance has been safe, reliable, and economical. Peach Bottom Unit 2 set an all time free world record for annual electrical energy output by a single generating unit--either nuclear or fossil-fueled. This 1,055,000 kilowatt unit produced over 8.5 billion kilowatt hours during 1979. The unit operated at 93.1% of its capacity during the year.

Limerick on line will save Philadelphia Electric Company's 1.3 million customers about $430,000,000 per year. Over the first few years of operation, a 500 KWH per month customer will save about $6.30 per month on his or her electric bill. This $6.30 per month or $75 per year is the minimum expected saving; actual savings will most likely be greater, especially after the first few years of operation. The alternatives to Limerick would mean higher electric bills for our customers.

In recent years, we have periodically studied the comparative costs of nuclear, oil and coal-fired generation. These studies consistently point to nuclear as the most economical for our customers.

We recently compared the costs of a two unit nuclear plant and a three unit coal plant for completion in 1990. Electricity from the nuclear plant was estimated to cost 6.9¢/kwh compared to 8.6¢/kwh for the coal plant. The annual reduction in costs amounts to about $250,000,000.

Likewise, in February 1979, the Nuclear Regulatory Commission published a report, "Total Generating Costs: Coal and Nuclear Plants." As a result of their analysis, the NRC estimates differential savings for a nuclear plant to be in the range of 2 to 3¢/kwh.

All competent estimators arrive at the same conclusion: in the northeastern part of the U.S., nuclear generating units are cheaper than coal-fired generating units.

The substitution of coal, solar power and wind power for nuclear, if practicable, would, of course, save an equivalent amount of oil, but at the ratepayers' expense. If Limerick Station were replaced with an equivalent coal station, the earliest such a station could be built is 1990. In 1990, we estimate electricity from Limerick Station will cost about 7¢ per kwh. If the station were replaced by the equivalent coal units, electricity would cost about 8.5¢/kwh. A discussion of the alternate of converting Limerick to a coal-fired station, as well as other alternatives, will be presented in the Environmental Report to be submitted with the Limerick operating license application. Solar and wind-powered stations are so impractical that it is hardly reasonable to mention them for comparison. Electricity from an equivalent wind-powered station would cost about 30¢/kwh and cover 7800 square miles or three times Philadelphia Electric Company's service territory.

An equivalent solar station would produce electricity at about 40¢/kwh and cover a land area of 20 to 50 square miles.

Nuclear power stations not only cut the cost of electricity for our ratepayers, they also significantly reduce the U.S. dependence on oil imported from the Mideast. Limerick on line will save the country 22,000,000 barrels of oil each year, more than the daily consumption rate for the entire country.

Our regional power forecasts show a heavy dependence on foreign oil supplies for adequate reserve capacity. Philadelphia Electric Company is a member of the regional power pool called the PJM Interconnection. The current forecast of peak demand and installed capacity is shown below.

	1985	1986	1987
Peak demand (Mw)	38,600	39,600	40,550
Installed capacity w/Limerick (Mw)	50,613	51,934	54,163
Installed capacity w/o Limerick (Mw)	49,558	50,879	52,053

The PJM Interconnection appears to have adequate reserve generating capacity in the years 1985 through 1987. However, the 54,000 Mw of generating capacity expected in 1987 includes over 9,000 Mw of generating capacity to be installed between 1980 and 1987. Some of this generating capacity will probably experience a slippage in service dates and not be installed by 1987.

One hundred percent of the reserve generating capacity is oil-fired. Thus, for reserve capacity, the PJM customers are dependent on a continuous stream of oil tankers from the OPEC nations, which supply could be interrupted at any time.

Philadelphia Electric Company and the entire electric utility industry are very much aware that the public has a legitimate interest in the safety aspects of nuclear generation as well as its economic aspects.

During the Limerick construction permit proceedings before the Atomic Energy Commission, the Advisory Committee on Reactor Safeguards, established by Congress to independently review the safety aspects of nuclear reactors, concluded that the Limerick Station could be constructed and operated without undue risk to the health and safety of the public.

The major determinations of the AEC's Division of Reactor Licensing in the Limerick construction permit proceedings can be briefly summarized as follows:

- The distances established for the exclusion zone, the low population zone, and the nearest population center meet the regulatory requirements.
- Site meteorology, hydrology, geology, and seismology are all acceptable.

- The design of the reactor vessels, reactor internals, and fuel assemblies are acceptable.
- The piping systems associated with the reactor are designed in full compliance with AEC requirements and are provided with appropriate restraints and supports to prevent damage to containment and equipment in the unlikely event of a pipe break or rupture.
- The leakage control and leakage detection systems are acceptable.
- The design of the primary containment system employing the over/under configuration is acceptable.
- The design of the reactor building (secondary containment) being of reinforced concrete construction throughout and provided with air recirculation systems together with an improved standby gas treatment system to limit the release of radioactive effluents is acceptable.
- The systems provided to inert the primary containment atmosphere and to control hydrogen generation following an accident are acceptable.
- The design of the emergency core cooling systems includes improvements in the high pressure and low pressure coolant injection systems which enhance the cooling of the fuel cladding during postulated accidents and is acceptable.
- The criteria established for and design of instrumentation, control, and electrical power systems are acceptable.

- The design of the radioactive waste treatment and handling systems include improvements and features beyond those of other contemporary plants and is acceptable.
- Analysis of design basis accidents (loss-of-coolant, fuel handling, control rod drop, and main steam line break) yield calculated offsite exposed dosages which are well within the regulatory limits.
- The Quality Assurance Program complies with the regulatory requirements and is acceptable.

The Safety Evaluation found that there is reasonable assurance that the proposed Limerick facility can be constructed and operated at its proposed location without undue risk to the health and safety of the public.

Since 1970 and prior to the Three Mile Island accident, the Company added a number of new and improved features to the original design of the Limerick plant. These features include the following:

- Increased design margin on essential piping systems.
- Improved reactor shield design and installation of vibration monitoring systems.
- Increased seismic design criteria.
- Leak-tight reactor building of reinforced concrete construction incorporating air recirculation and high efficiency filtration systems.
- Chilled charcoal waste gas treatment system to further reduce radioactive releases.

- Provisions for inerting and hydrogen control of primary containment atmosphere.
- Systems for preventing leakage from piping systems.
- Additional emergency power supply systems.
- Additional quality control and inspection systems.

Shortly after the accident at Three Mile Island, the Nuclear Regulatory Commission, industry groups, such as the Electric Power Research Institute, individual utilities, and the President's Commission began to review the details of the accident and to assess its causes so that similar accidents would be prevented. Although our Peach Bottom and Limerick units have boiling water reactors, which are different in design from the pressurized water reactors at Three Mile Island, the results of these reviews provided valuable insight for us on reactor safety.

At its annual meeting of shareholders on April 4, 1979, Mr. J. L. Everett, President of Philadelphia Electric Company, stated the Company "will analyze the accident thoroughly and review our own plant's design and operation to make certain we apply what we've learned to improve the safety of our facility wherever possible." A week later, I established the Three Mile Island Event Committee to review the sequence of events of the accident and preparing recommendations to be used in evaluating the nuclear facilities. This Committee comprised five engineers from Philadelphia Electric Company and representatives from Atlantic Electric Company, Delmarva Power & Light Company, and Public Service Electric & Gas Company. The Committee's report was issued on August 22, 1979, and it contained 22 recommendations for implementations, both immediate and long term.

The NRC initially reviewed the five operating Babcock & Wilcox plants of similar reactor design to that of Three Mile Island. The NRC then focused on the operating reactors designed by Westinghouse, Combustion Engineering and General Electric Company to determine if measures to reduce the potential for accidents should be implemented at plants designed by these companies.

The NRC has sent to all utilities with nuclear power plants under construction requirements necessary to provide substantial additional protection for the public health and safety and which must be implemented prior to receipt of an operating license. They cover principally training and operating procedures, plant design and emergency planning. Limerick Generating Station will meet these requirements.

For example, in the area of plant design, the safety valves on each nuclear steam supply system will be provided with acoustic emission monitors to better detect their opening. Acoustic emission monitors to better detect the opening of the safety relief valves at our Peach Bottom units were installed as an innovative research project even prior to the accident at Three Mile Island. We are also designing the primary containment isolation valves to prevent inadvertent reopening should an accident occur. We are also reexamining the adequacy of shielding to protect operators and equipment from high radiation coming from systems containing primary coolant or primary containment gases. Additionally, radiation monitors having the capability of measuring very high levels of radiation will be added to the plant.

In April 1979, the utility industry through its Electric Power Research Institute (EPRI) established the Nuclear Safety Analysis Center (NSAC) to investigate the Three Mile Island accident.

With a budget for 1980 of $7.5 million, NSAC has established the following work programs to respond to the needs of the utility industry.

The Significant Event Evaluation Program has been established as a mechanism for systematically searching nuclear plant operating experience for early warning signs of potentially serious events.

In-depth studies of significant events will be performed, such as the already completed review of the incident at the Crystal River plant in February, 1980.

Generic safety studies, such as information display in control rooms and application of probabilistic risk assessment, will be performed.

A library of technical and operating information has been established, and rapid communication of information pertaining to safety is transmitted to utilities with a small computer terminal. (This communication tool is called NOTEPAD, and the Philadelphia Electric Company uses this service.)

In October 1979, the Institute for Nuclear Power Operations (INPO) was incorporated for the purpose of providing industry-wide standards of excellence in nuclear power operations and of conducting evaluations of utilities to help them meet these standards. This will include determining the educational and training requirements for operating personnel and certifying instructors. INPO will also develop training programs for plant supervisors and identify the best practices for nuclear plant operations. Pilot evaluations of nuclear plant operations have already been performed. The first official evaluation is scheduled for May 1980.

Philadelphia Electric Company is a member of INPO along with 56 other utilities. INPO is working with a budget of $11 million for 1980, and is developing a staff which should number around 200 by the end of the year. A Board of Directors has been formed consisting of senior utility executives and an advisory board consisting of persons drawn from academia, industry, the aerospace program, and technical societies. The activities of INPO will be closely coordinated with NSAC.

The objectives of NSAC and INPO have been established to increase the assurance that nuclear power plant operations are performed safely. These objectives address some of the major recommendations made by the President's Commission. Philadelphia Electric Company will benefit from both of these organizations.

The NRC published last October the Final Report of the Lessons Learned Task Force. In contrast to the short-term recommendations of the Lessons Learned Task Force, which were a more narrow, specific, and urgent nature, this final report addresses safety questions of a more fundamental policy nature.

The Long-Term Lessons Learned can be characterized as recommendations oriented toward improving training, operator qualifications and licensing. These Long-Term Lessons Learned recommendations have been incorporated into the NRC's TMI Action Plan.

The TMI Action Plan has been developed by the NRC to provide a comprehensive and integrated plan for all actions judged necessary by the NRC to correct or to improve the regulation and operation of nuclear power plants based on studies and investigations of the Three Mile Island accident. Many of the recommendations have already been implemented at operating plants. Most of the other recommendations are scheduled to be completed over the next two years.

Philadelphia Electric Company has long been a leader in nuclear training. As early as 1958, certain key people, now in managerial positions, were training in nuclear power in preparation for the operation of our first nuclear project, Peach Bottom Unit 1. That early plant was equipped with a small simulator to assist in operator training.

For Limerick, it was recognized that training must be preceded by a thorough selection program. About 2-1/2 years ago, such a program was devised and implemented. Out of approximately 280 who first expressed interest in Limerick, a group of 55 highly qualified individuals were selected. This group consists of some with fossil experience, some with nuclear experience and some with both fossil and nuclear experience. Our goal is to integrate all of this valuable experience at Limerick.

The training program includes: academic training in heat transfer, fluid flow and thermodynamics; research reactor training at Pennsylvania State University; observation training at Peach Bottom; boiling water reactor technology; Limerick design features; plant familiarization programs, and simulator certification, which is expected to be a 12-week certification course on the Limerick simulator.

To facilitate this training, as well as augment the training of Peach Bottom operators, a decision was made in 1978 to build a training center near the Limerick site and equip this center with a simulator. It is designed specifically like the plant and will simulate the Limerick units in appearance and response characteristics. The simulator meets or exceeds all the requirements of the American Nuclear Society's standards for nuclear power plant simulators. The training center will be operated by General Physics Corporation. The building was completed recently, and the simulator is presently undergoing testing at the manufacturer's plant. It is expected to be installed in the training center in September and be ready for operator training in January.

Since the simulator was ordered prior to the Three Mile Island accident, a review was conducted of the design to be sure that the machine and the instruction complied with the post-TMI requirements.

There will be training in the use of installed plant systems to control or mitigate an accident in which the core is severely damaged. There will also be increased emphasis on handling changes in plant or reactor conditions. The simulator is capable of demonstrating variable loss of coolant accidents both inside and outside of containment. Various sizes of loss of coolant accidents including small breaks will be part of the program. The training center instructors will be qualified to take an NRC senior operator examination prior to instructing operators.

At Limerick, we plan to operate and train as a team. There will be six teams rather than the usual four or five, and the schedule will be so arranged that there will be four days' training every six weeks. By this staffing arrangement, we will meet or exceed the recommendations of the Kemeny Commission Report in that training will be continuously integrated with operating experience.

From the earliest days of the design of the control room panels at Limerick, individuals with an operating background were involved. As a result of this involvement, all the panels at Limerick are pictorialized, making it much easier for the operator to follow the course of events. Human engineering has also been a factor in control room design. Most of the devices which must be frequently manipulated by the operator are on the bench boards while the more seldom used devices or recording devices are on the vertical boards. The equipment related to one particular system is adjacent to other equipment on the same system. Systems are separated by well defined black lines to help avoid operator confusion. Certain information is transmitted to the operator using color video tubes. These tubes were mocked up and the displays modified to be sure there was not excessive information density on any one "page," and to insure that the information was legible and understandable. There is an on-going task force within the Company studying the human engineering of the panels.

Peach Bottom procedures will be used as a pilot for writing Limerick procedures so that, rather than starting with nothing, Limerick will be able to build on the Peach Bottom experiences. By so doing, the Limerick procedures

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will reflect the TMI lessons learned, as well as other operational experience that has been gained at Peach Bottom.

Another key factor in the translation of operating experience from Peach Bottom to Limerick is in the area of the plant technical staff. Several individuals on the staff have many years of Peach Bottom experience and other individuals have U.S. Navy nuclear submarine experience. The remaining individuals have years of fossil plant operating experience. This mix of training and experience of the key management group at Limerick will assure that sound operating practices are established and followed.

In the Preliminary Safety Analysis Report filed with the Construction Permit Application, the basic components of an emergency plan to be developed for Limerick were discussed. These components were based upon our Peach Bottom plan, as it existed then, and this submittal was found by the AEC to fully meet its requirements. Since that submittal in June 1971, we have had, through our Peach Bottom operations, the benefit of years of operating experience, the experience of emergency plan drills, and of periodic emergency planning reviews.

Pursuant to NRC requirements, an emergency plan for Limerick Generating Station is being prepared for submission as part of the Final Safety Analysis Report when Philadelphia Electric Company applies for the Limerick operating license.

The plan will reflect the changing requirements for such plans since Three Mile Island as expressed in NRC regulations; NUREG-0578 on Short-Term Lessons Learned; NUREG-0610 on Classification of Emergency Conditions;

Emergency Planning Acceptance Criteria; NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants; and NRC's letter of April 25, 1980, regarding emergency centers.

Many of these changes in criteria require in-depth engineering studies, a review of the state-of-the-art in certain areas such as instrumentation, and coordination with State and local planners to ensure that the proper equipment and methods are utilized. In keeping with our philosophy of actively seeking ways of improving our operations and providing safe, reliable service, Philadelphia Electric has been, and will continue, evaluating and responding to these changes.

The Limerick emergency plan will provide for facilities, equipment, organization, and methods to ensure the capability for rapid response to a wide spectrum of abnormal conditions, ranging from minor events which may be anticipated at any large industrial facility to postulated accidents with only a remote probability of occurrence. It will include the means for continuing assessment of plant conditions, communication with appropriate off-site authorities, and for activating the technical and physical resources of many groups in the nuclear industry. The plan will provide for reliable communication methods and transmittal of information to assist State and County officials in decision making. Major features of the plan will include:

- The definition of four distinct emergency classes of accidents as provided in NUREG 0654 and NUREG 0610.

- Establishment of well-defined criteria for declaring the various classes and for implementing immediate response actions.
- Assignment of shift operations personnel to emergency teams to provide immediate response.
- Assignment of Limerick technical staff personnel to emergency teams to ensure rapid response to assist shift operations personnel.
- A Technical Support Center in which senior members of the plant technical staff can evaluate conditions and assist shift personnel in making plant operational decisions.
- Establishment of a Philadelphia Electric Company headquarters support organization to provide assistance in the areas of technical evaluation and logistics support. With some adjustments, this organization will be very similar to that employed for many years by the Company in the restoration of electrical service under storm conditions.
- Establishment of a long-term recovery organization capable of in-depth technical evaluation, coordination of resources available throughout the nuclear industry, and development of recovery plans.
- A flexible communications capability to activate the various emergency teams and organizations and to ensure uninterrupted flow of information.

- Coordination of responsibilities and resources of on-site and off-site groups, including Federal, State and local agencies.
- Pre-planned procedures to define emergency responses.
- Provisions for medical assistance and transportation.
- Training of emergency teams and other positions in the emergency organization.
- Performance of drills to test the capabilities of the various teams and organizations.

In keeping with the Company's full disclosure policy of providing the news media and the public with information on our nuclear power plant operations, revision of the specific emergency public information plan was started following an intensive analysis of communications problems at Three Mile Island. This plan will provide the facilities and methods for the timely release of accurate information in conjunction with other information agencies which may be involved.

With these features, Philadelphia Electric is confident that when the plan is completed, it will meet the NRC requirements and will be fully compatible with State and local plans.

To date, we have had meetings with the Pennsylvania Emergency Management Agency (PEMA), The Bureau of Radiation Protection of the Pennsylvania Department of Environmental Resources, and, as directed by PEMA with Emergency Planning officials of Montgomery, Chester, and Berks Counties.

Our goal is to have an emergency plan which is responsive to the most recent NRC criteria, which is fully coordinated with the Pennsylvania

Emergency Management Agency and County Plans and which utilizes the experience gained at Peach Bottom. Further, while we believe that the conservative design of the plant, its extensive safety features, and the operation of the plant by well-trained personnel will preclude the need to ever fully utilize the plan we will be ready, with trained personnel, to fully implement the plan for the protection of employees and the public.

ENVIRONMENTAL COALITION ON NUCLEAR POWER

Co-Directors: Mr. George Boomsma—R.D. #1, Peach Bottom, Pa. 17563 717-548-2836
Dr. Judith Johnsrud—433 Orlando Avenue, State College, Pa. 16801 814-237-3900

Statement before the

House Committee on Interior and Insular Affairs
Subcommittee on Energy and the Environment

by

Dr. Judith H. Johnsrud
Environmental Coalition on Nuclear Power

May 27, 1980

Introduction

My name is Judith H. Johnsrud. I am a geographer by profession, and serve as Co-Director of the Environmental Coalition on Nuclear Power (ECNP), a public-interest organization composed of citizen groups and individuals in Pennsylvania and adjoining states. Founded in 1970 out of widespread concern about the safety of nuclear power reactors then proposed and under construction in the Delaware and Susquehanna Valleys, ECNP is one of the nation's oldest "grassroots" citizen groups involved in research, public education, and litigation pertaining to nuclear power, the nuclear fuel cycle, and safe energy alternatives.

On behalf of our members, and especially of our eastern Pennsylvania, Bucks County, and Limerick Ecology Action members, we appreciate the Subcommittee's invitation to testify today on the topics of radiological emergency preparedness and evacuation planning in the vicinity of nuclear power reactors and on "Lessons Learned" from the Three Mile Island (TMI) accident as they apply to the Limerick nuclear reactors under construction some 35 miles upwind of the location of today's field hearings. The Limerick reactors are now admitted by the NRC to be among the worst-sited in the nation, along with Indian Point near New York City and Zion to the north of Chicago.

In addition, in my capacity as the vice-chairperson of the National Solar Lobby and as a member of the Pennsylvania Governor's Energy Council Advisory Committee,[1] I should like to address a few comments to the important question of the reasonable alternatives to nuclear power plants such as the Limerick reactors.

Background

In the late 1960's, Pennsylvania and New Jersey utilities were led to believe that nuclear power reactors would provide safe, clean, reliable, and inexpensive electricity.[2] Their reluctance to invest in nuclear power was lessened by passage, in 1957, and renewal, in 1965, of the Price-Anderson Act, relieving utilities of liability beyond a $560 million maximum in the event of a catastrophic nuclear reactor accident, such as had been analyzed in the 1957 Brookhaven Report, WASH-740.[3] Subsequent review and revision of the Brookhaven Report by the Atomic Energy Commission (AEC) in 1964-5 was designed to assess the greater hazards associated with the 1,000-megawatt reactors then beginning to be ordered. The results of the 1964-5 Revision were suppressed until 1973. Those "working papers" should be carefully reviewed by this committee. As the appended examples of the minutes, reports, and other items from those working papers show, the Brookhaven-AEC researchers concluded that a nuclear reactor accident that resulted in a breach of the containment structure could indeed have catastrophic consequences at large distances from a reactor, not merely 10 or 20 miles. We draw your attention to the conclusions stated in the October 21, 1964, Steering Committee minutes:[4]

> Mr. Downes stated that if containment works, there is 100% retention. However, if a hole in the containment results, the maximum amount that would be released would depend on the size of the hole, and since there was no basis for a choice they had arbitrarily chosen ½ m^2. They had asked themselves whether an appreciable fraction could get lost on the way out, but found no basis for concluding this. Mr. Downes said that they based their land contamination values for iodine on the FRC PAG report (Report No. 5). The proposed future FRC report for Cs, etc. cannot be factored in now. They found that at 100 km the levels were still 100 times the PAG. The result if a city were involved would be catastrophic and there would be deaths out to 150 km.

It must be emphasized here that 150 kilometers equal approximately 90 miles; Three Mile Island lies about 90 air miles upwind of Bucks County. New York City is approximately 90 miles from Limerick. Philadelphia is, of course, only about 20 miles away. Another Revision document states:

> Assuming coolant loss in a large 3200 Mwt reactor, a fuel cycle of 1000 days, and sequential failure of all engineered safeguards including the containment structure, radioactive contamination to significant activity levels would be distributed over an area from from 10,000 to 100,000 square kilometers. For I^{131}, a contamination level higher than 10 rad to the thyroid would extend beyond 1000 kilometers.[5]

While many people have mistakenly assumed that the Rasmussen Report, the Reactor Safety Study, WASH-1400, superceded the WASH-740 Revision working papers, the Nuclear Regulatory Commission does not so state, and to my knowledge the NRC does not deny the AEC's earlier grim conclusions quoted here, and has, in fact, attempted to repudiate the existence of its predecessor's findings only by simply ignoring them. It should be further noted that the original 1957 Brookhaven Report had stated, in the final paragraph of the Introduction,[6]

> More definitive information on estimated factors would probably tend to reduce the estimates of damages, though in a few instances the converse might be true. There are a few less usual weather conditions which occur perhaps 5 percent of the time and which could yield estimated damages outside the range of the figures stated here. Therefore, this study does not set an upper limit for the potential damages; there is no known way at present to do this.

Against this background of the area that could be lethally affected by a breach of containment accident (not necessarily preceded by many hours of core melting) and the uncertainty of the upper bounds of damage potential, we must examine the history of the siting and licensing of the Limerick and Newbold Island reactors, of Philadelphia Electric Company (PE) and Public Service Electric and Gas Company (PSEG) respectively. These pairs of reactors were announced to the public at the end of the 1960's when the future growth of nuclear power appeared most promising. Limerick was sited on PE-owned property on the Schuylkill River a scant two miles from Pottstown, in an area even then ripening for additional suburban development. The area was one of the last remaining open corridors for urban expansion at a time when the metropolitan tidal wave was continuing to expand farther outward from Philadelphia.[7] Proposed expressway construction, the proximity of Pottstown, the stability and attractiveness offered by the Valley Forge National Historical Park -- all contributed to the pressure for residential, commercial, and light industrial development in adjoining Montgomery and Chester Counties. Those predictions of eight years ago have indeed come to pass, even as the construction of Limerick has slowly proceeded, despite failure to resolve the issue of assured water supply for the reactors, as well as growing concern about this siting, rising costs, and declining electricity demand.

It should be noted that Pennsylvania's Director of Radiological Protection, Mr. Thomas M. Gerusky, had testified also in the 1972 Limerick hearings, stating that prompt evacuation of pregnant women from the Pottstown area could not, even then, be assured to protect them from unacceptably high radiation doses in the event of a Design Basis (Class 8) accident at Limerick. Consideration of Class 9 accidents-- i.e., those as severe as the TMI-2 accident or worse -- was excluded by the AEC Licensing Board in the Limerick case as being "too improbable" to merit examining their consequences. This exclusion is still the practice of the NRC, even since TMI-2 has demonstrated that a Class 9 accident not only can occur but has occurred within the initial 100 days of a reactor's operation. Surely, in its exercise of the power of the purse, the Congress has the authority to require that the NRC undertake full accident consequence analysis, as well as full compliance with the National Environmental Policy Act in the licensing and continued permission to operate licensed nuclear reactors.

Yet construction of Limerick has been permitted to continue, even as the AEC backed away from an urban siting policy in the early 1970's and even now when it has become apparent that the downwind Philadelphia-Trenton population at risk from the Limerick reactors will be, along with New Yorkers and Chicagoans, the most vulnerable, unevacuable people in the nation. I repeat the AEC's conclusion: "The results if a city were involved would be catastrophic...."

Equally instructive to this Subcommittee should be the history of Newbold Island 1 and 2, boiling water reactors that were to have been built on the very margin of Congressman Kostmayer's own District. In 1972 AEC Construction Permit hearings, the ECNP Intervenors and counsel for Falls Township were able to show the total inadequacy of the Applicant's analysis of the size of the working, transient, and anticipated populations within the Low Population Zone surrounding that Delaware River site. To have been located literally in the heart of the Trenton-

Philadelphia Standard Metropolitan Area, Newbold Island would have occupied the most dangerous urban site in the entire nation, had not the people of Bucks County and our statewide Environmental Coalition on Nuclear Power and Limerick Ecology Action determined to challenge PSEG in lengthy, expensive hearings nearly a decade ago. Faced with flagrant violations of its own inadequate siting criteria (10 CFR 100.11) the AEC staff backed off, and proposed that the utility select instead an alternate, less densely populated site, at Hope Creek, adjacent to the already-approved Salem 1 reactor at Artificial Island in Delaware Bay.

Note that the AEC's Licensing Board did not deny a construction permit, but rather the staff threatened to oppose the Applicant unless the siting change was made. That trade-off says clearly that the rights to protection from the risk of a catastrophic reactor accident were to be given to an urban population but denied to rural residents, solely on the basis of population density. In our view, this agency siting decision constitutes unequal protection under the law to individuals who reside in sparsely populated areas, requiring them to assume risks deemed unacceptably high for urban dwellers. No consideration is given to, for example, the greater difficulties of notification of rural people in the event of an accident or of their lesser ability to evacuate or to abandon domestic animals -- a point poignantly raised by the Amish folk of Central Pennsylvania following the TMI-2 accident.

Furthermore, in response to the Newbold Island reversal of AEC/NRC urban siting policies, the Pennsylvania utilities in 1975 moved toward the alternative of "Energy Parks" -- a complex of up to 20 nuclear reactors and coal-fired plants on a single massive site in rural counties of this Commonwealth. Energy Parks were clearly a national test case for the acceptance of Nuclear Energy Centers, the gigantic nuclear complexes proposed to consolidate almost all aspects of the hazardous nuclear fuel cycle on a single site. They were vehemently rejected by the people of Pennsylvania.

But the notion of remote rural siting of reactors has arisen again before this Congress in the aftermath of TMI, as an acceptable alternative to having to plan for mass evacuation. Organizations such as the Public Interest Research Group have petitioned the NRC to conduct rulemaking proceedings to prohibit the construction of nuclear reactors within approximately forty miles of major urban centers. We believe that these proposals reverse the proper priorities and would further destroy the Constitutional guarantee of equal protection under law.

Instead, ECNP would urge the support of "load-center" siting, in the interests of achieving spatial justice: those who want the "benefit" of the electricity should also be willing to bear the risks and the pollution that accompany its generation. If a nuclear reactor is not safe enough to be constructed and operated in the heart of a metropolitan area, then it is not safe enough to be sited anywhere else.

The Environmental Coalition has particular qualifications to address the issues before this Subcommittee. Our participation in the AEC Construction Permit proceedings for Limerick and Newbold Island, beginning in 1971-72, have been followed by Dr. Kepford's and my direct litigative participation, in the absence of legal counsel,[8] in the still incomplete operating license for TMI-2. In the 1977 evidentiary hearings on TMI-2 we conducted the cross-examination of NRC, Commonwealth, and Dauphin County officials responsible for TMI evacuation, from whom we could elicit no clear delineation of the legal lines of notification responsibility in the event of a radiological emergency but from whom we received repeated assurances, under oath, that the preparations were more than adequate to provide for speedy removal of the entire population within the 4.8-mile radius of TMI within hours of an initiating event. Those parties argued against live drills to instruct the close-in residents on how to carry out an evacuation. We found the local civil defense director to be so unschooled in the nature of radiation health effects that he could neither define a radiation injury nor state the maximum radiation exposures which his volunteer emergency personnel are allowed to receive. It became apparent that neither the County nor the Commonwealth was prepared for any evacuation beyond the 4.8-mile radius imposed by the utility's estimate of the distance that might be affected by a Design Basis Accident. Again, we must emphasize the NRC's reliance on calculated probabilities as an excuse to cut off examination of accidents more serious than the redundant safeguards systems were designed to mitigate (i.e., "Class 8" accidents).

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[8] ECNP groups had incurred substantial debts to attorneys in the Limerick, Newbold Island, Peach Bottom and TMI-1 licensing cases. Our decision to become surrogate lawyers was a distasteful consequence of the NRC and congressional failure to fund Intervenors. I would add that in addition to research and to appearing as witness in the Limerick and Newbold Island cases, I have assisted Dr. Kepford in the Fulton, Peach Bottom, TMI-1 and 2, and Susquehanna cases. We have participated also in NRC generic proceedings on Mixed Oxide Fuels (GESMO), "Table S-3" Environmental Effects of the Uranium Fuel Cycle, and the Reassessment of Confidence in the Availability of Radioactive Waste Disposal and Spent Fuel Storage.

Emergency Response and Evacuation Issues

An especially troubling fact that emerged from the TMI-2 record was the testimony that state and local police already possess the authority to prevent evacuation as well as to perform it. Ostensibly, this authority would be utilized to speed the removal of the residents closest to the reactor, to get them safely away before roadways clog, trapping them in a radiation plume. But, given the obvious inadequacy of available medical facilities or refugee centers to cope with the large numbers of radiation-injured or heavily contaminated people, we must now ask the following question: in the aftermath of the near-catastrophe at TMI, is it intended, or will it happen, that this authority to prevent evacuation may be used to detain and cordon off those living in the vicinity of a nuclear reactor if it is determined that they cannot be safely evacuated prior to the arrival of a lethal radioactive plume following a breach of containment accident?

It is not "anti-nuclear fantasy" that prompts the question. Rather, it is the wording of an NRC document which was put into "interim use" in September, 1979. This document gives rise to the serious charge that we must make here today: namely, the widely-publicized NRC and Federal Emergency Management Agency plans for radiological emergency preparedness and response and evacuation planning belie the government's recognition that safe evacuation of populations in the event of a catastrophic radiation release from a nuclear reactor will be impossible. The real intent of the agencies, we believe, is to be found in the NRC document NUREG-0610, entitled, Draft Emergency Action Level Guidelines for Nuclear Power Plants, dated September, 1979. This document, which was then released in draft form for public comment, was also immediately put into "Interim Use" six months after the TMI accident began. It establishes the four classes of "Emergency Action Levels" to which a utility is required to respond. These are "Notification of Unusual Event,""Alert,""Site Emergency," and "General Emergency." It outlines the Class Description, Purpose, Radiation Release Potential, Expected Frequency, Licensee Actions, State and/or Local Offsite Authority Actions, and Example Initiating Conditions for each category of accident.

We call your attention to the fact that no notification of the press is indicated until conditions are serious enough for a site emergency to be declared (p. 1-9) and that the release potential may be as "high as 1,000 ci [curies] of I [odine] -131 equivalent or up to 10 ci [10 million curies] of xe [non] -133 equivalent" before this category of accident need be declared.

A "General Emergency," such as the TMI accident, need not be declared until the release potential exceeds 1,000 curies of I-131 equivalent (only about 14-15 ci of I-131 were believed to have been released at TMI) or 10 million curies of Xe-133 equivalent. The General Emergency Class is defined (p. 1-12) as "Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity." The first "Example Initiating Condition" cited (at p. 1-13) states "Effluent monitors detect levels corresponding to 1 rem/hr W.B. [whole body] or 5 rem/hr thyroid at the site boundary under actual meteorological conditions" (emphasis in the original).

It is important to note the exact wording of the guidelines (at p. 1-1):

> The immediate action for this [General Emergency] class is sheltering (staying inside) rather than evacuation until an assessment can be made that (1) an evacuation is indicated and (2) an evacuation, if indicated, can be completed prior to significant release and transport of radioactive material to the affected areas.

If a very light breeze is blowing at, for example, 4 miles per hour, persons living half a mile from the site boundary would have only 7½ minutes to be notified, pack and leave prior to the arrival of radioactive material. We must regretfully conclude, therefore, that these Guidelines to the utilities are the NRC's replacement in actual fact for the fantasy that evacuation can be accomplished following a major radiation release.

It is very unlikely that any future Class 9 reactor accidents will give an evacuation opportunity comparable with the accident at TMI -- where there was delayed release of radiation, with several days of crisis. It is very hard to leave your home on a moment's notice, with an understanding that you may never be able to return, even when your life is at stake. Perhaps you in Washington will have to experience it, as we did here in Pennsylvania, in order to understand. But we now believe that the NRC understands that evacuation cannot, and will not, be accomplished. The rulemaking, the criteria, the State and local plans -- all are paper placebos for the public who on the whole have not yet been able to absorb the terror of TMI that was experienced in Middletown and Goldsboro and Harrisburg and much of Central Pennsylvania a year ago.

Indeed, the NRC's Advisory Committee on Reactor Safeguards (ACRS) has recently noted[9] that its predecessors in 1960 had stated:

> 1. Everyone off-site must have a reasonably good chance of not being seriously hurt if an unlikely but credible reactor accident should occur.
>
> 2. The exposure of a large segment of society in terms of integrated man-rems should not be such as to cause a significant shortening of the average individual lifetime or a significant genetic damage or a significant increase in leukemia -- should a credible reactor accident occur.
>
> 3. There should be an advantage to society resulting from locating a plant at the proposed site rather than in a more isolated area.
>
> 4. Even if the most serious accident possible (not normally considered credible) should occur, the numbers of people killed should not be catastrophic.
>
> (emphases added)

Not indicating that they were rejecting these 20-year old siting policies, the ACRS goes on to suggest that the NRC circumvent the problem by adopting "objectives for acceptable risk both to individuals and society."

We believe that we have seen, in the year since the TMI accident began, a massive endeavor by the nuclear industry and NRC to convince Americans (who now know reactors are dangerous) that nuclear power is nevertheless essential to economic well-being and, hence, worth the risk. We are being conditioned to accept moderately severe reactor accidents as "acceptable risks" with the NRC empowered to define the difference between an "acceptable" death and injury toll and a "catastrophic number of deaths." Is the ACRS suggesting that risk of reactors in low population density rural areas should be considered an "acceptable risk," but large numbers of urban deaths be deemed an "unacceptable catastrophe"? More insidiously, is it being proposed that a few rural deaths will be tolerated, and the delayed cancers and leukemias from latent, non-fatal injuries to the more distant urban population will be ignored?

The NRC's handling of the TMI accident has, however, limited the public's perception of the hazard zone to approximately a 20-mile radius of a reactor.[9a] The NRC/EPA Task Force on Emergency Planning reflects an even narrower approach by limiting the Emergency Planning Zones (EPZ) to a 10-mile radius for plume exposure and a 50-mile radius for ingestion exposure pathways. A careful reading of the considerations upon which those distances were based reveals a guarded wording that omits the worst possible case conditions:

> ... for the worst core melt sequences, immediate life threatening doses would generally not occur outside the zone.
>
> (emphasis added) [10]

In partial confirmation of ECNP's concerns in this regard is the recent study prepared for the President's Council on Environmental Quality by the Environmental Law Institute, entitled, NRC's Environmental Analysis of Nuclear Accidents: Is It Adequate? [11] Although this report is directed toward NEPA compliance in the writing of Environmental Impact Statements, the authors' conclusions concerning the deficiency of NRC Class 9 accident analysis are equally applicable to NRC's evacuation planning.

Yet even now, as the NRC considers reopening of TMI-1, ECNP's contentions that many assumptions underlying emergency preparedness and evacuation planning are faulty and wholly unrealistic have been rejected by the Atomic Safety and Licensing Board. Dr. Kepford's testimony describes in greater detail this continuing refusal by the NRC to tackle realistically the Sisyphean task of preparing for a successful evacuation in the event of a catastrophic reactor accident.

We ask the Congress, and especially this Subcommittee, to address themselves specifically to these preparedness and evacuation issues. It is imperative that the Congress supervise in far greater detail the actions of the regulatory agency in these crucial planning areas, because the NRC is simply not doing the job.

Initially, it may not appear to be politically popular to do so. We find the American people have developed a feeling of deep unease about nuclear power since the TMI accident. They are beginning to comprehend that the magnitude of the hazard potential is far greater than they had ever been led to believe. In our experience, most people would rather not have to think about nuclear power risks. Yet, knowing that the risk will not disappear for wishing it so, voters will, we believe, respond with gratitude to an aggressive Congressional reassessment of the national commitment to the use of nuclear energy.

That commitment, as we all recognize, was made at another time when technological problems perhaps appeared easier to resolve than they have turned out to be. Piecemeal considerations by Congress or the NRC of a remedial action or two, a quick technical "fix," a temporary storage solution, will not suffice. What is required is a major revision of those aspects of the Atomic Energy Act that mandate the development of the peaceful uses of nuclear energy. What is also required is a major revision of Congressional budgetary allocations of energy dollars.

The demise of the AEC's Plowshare program to promote engineering uses of nuclear energy may be said to have begun a dozen years ago here in Pennsylvania, with public rejection of the Plowshare Project Ketch (to create underground storage caverns for natural gas by explosion of nuclear bombs). That rejection was followed by budgetary decline of the Plowshare Program.

The accident at Three Mile Island has given the nation a somber warning about the future of nuclear reactors that we will ignore at peril of our own and future lives, as well as the economic and political well-being of the nation. Budgetary decline for nuclear energy is the next step in preventing the folly of further commitment to nuclear power.

The incapacity of the NRC, state and local agencies of government, or the utilities to plan for, much less accomplish, successful evacuation speaks equally clearly to the unacceptable risk of nuclear power reactors. To allow an unwisely sited reactor such as Limerick to go on line -- and thereby to generate additional quantities of radioactive wastes in the absence of proven waste disposal capability, not to mention the plant itself thereby becoming a form of radioactive waste -- would be, I believe, an act of unconscionable irresponsibility on the part of any agency of government in the aftermath of TMI. If the complete, safe evacuation of populations at risk cannot be accomplished -- as we must conclude on the basis of our decade of intensive study -- then the Congress must finally face the inevitable conclusion that nuclear power is not a viable source of electricity. The sooner the decision is reached to reallocate tax dollars from nuclear energy to the rapid implementation of renewable alternative sources and conservation, the healthier, safer, and more secure our nation's future will be.

Conclusion

Continued operation of any nuclear reactors in the U.S. since the Three Mile Island accident has resulted from a willingness of Congress and the American people to give the NRC and the nuclear industry one final chance to reform. Both have failed to alter the "mindset" so criticized in the Kemeny Commission and Rogovin Group Reports. The NRC's continued and increasing curtailment of the public's access to information and the NRC'S use of procedural mechanisms to prevent effective public participation in reactor licensing demonstrate that the agency has not heeded the warning of TMI.

Our nation's energy future clearly lies with conservation and renewable alternatives. Of the 72 commercially licensed nuclear reactors, only 50 produced any electricity in the month of April, 1980.[12] Yet the Congress has reduced the budgets for conservation and solar applications at the moment when nuclear is failing.

We respectfully recommend that this Subcommittee exercise ever more vigorous leadership in the nation's transition to the energy- and other resource-constrained economy that inevitably lies before us. Wisdom is desperately needed in the political realm to effect this transition with minimal economic pain and dislocation as the United States moves toward energy efficiency, appropriate technology, and economic stability. We find an encouraging public receptivity to these changes. We urge Congressional actions to speed them.

NOTES

1. I have served also on the Governor's Task Forces on Energy Facility Siting and development of a Comprehensive State Energy Policy. I do not here represent, or associate my statement with, the views of any agency or official of Pennsylvania's State Government.

2. The utilities are Metropolitan Edison, Pennsylvania Electric Company, Jersey Central Power and Light; Philadelphia Electric Company, Pennsylvania Power and Light, and Public Service Electric and Gas.

3. U.S. Atomic Energy Commission, Theoretical Possibilities and Consequences of Major Accidents in Large Nuclear Power Plants, Brookhaven National Laboratory, WASH-740, 1957.

4. "Minutes of Steering Committee on Revision of WASH-740 at Brookhaven National Laboratory, October 21, 1964" Document 84, Working Papers, p.3.

5. "Trip Report - Meeting of the Steering Committee on the Revision of WASH-740," dated January 25, 1965, Document 82, Working Papers, p.2.

6. Op. cit., Introduction.

7. See testimony of Judith H. Johnsrud, In the Matter of Philadelphia Electric Co., Limerick Nuclear Station, Units 1 and 2, Construction Permit hearings, 1972.

8. See p. 6 above for contextual note.

9. Letter of Milton S. Plesset to NRC Chairman John F. Ahearne on NUREG-0625, Report of the Siting Policy Task Force, (no date) NRC News Release No. 80-38, February 21, 1980.

9a. See Peter Houts, Hershey Medical Center, research on psychological stress resulting from the TMI accident, 1980.

10. U.S. Nuclear Regulatory Commission and Federal Emergency Management Agency, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, NUREG-0654/FEMA-REP-1, January, 1980, p.9. See also NRC/EPA Task Force Report on Emergency Planning, Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants, NUREG-0396/EPA 520/1-78-016, December, 1978.

11. Environmental Law Institute, NRC's Environmental Analysis of Nuclear Accidents: Is It Adequate? Washington, D.C., February 4, 1980.

ENVIRONMENTAL COALITION ON NUCLEAR POWER

Co-Directors: Mr. George Boomsma—R.D. #1, Peach Bottom, Pa. 17563 717-548-2836
Dr. Judith Johnsrud—433 Orlando Avenue, State College, Pa. 16801 814-237-3900

Testimony of
Dr. Chauncey Kepford
Environmental Coalition on Nuclear Power
before the
Subcommittee on Energy and the Environment
of the
House Committee on Interior and Insular Affairs
May 27, 1980

Members of the House of Representatives, it is a pleasure and a privilege to appear before you to offer my views on the lessons learned from the near catastrophe at Three Mile Island, Unit 2 (TMI-2), which began over a year ago, and their implications for the Limerick reactors of the Philadelphia Electric Company.

By way of introduction and background, I have been educated as a chemist, with a Ph.D. degree from the University of Calgary, Alberta, Canada. I have worked as a radiation chemist for a major defense contractor and then taught chemistry at the York campus of the Pennsylvania State University. Since 1971, I have devoted virtually all of my efforts toward the study of, and opposition to, nuclear power.

In October, 1972, I initiated the operating license proceeding for Peach Bottom 2 and 3 by petitioning to intervene. That proceeding ended up in the U.S. Court of Appeals with, ultimately, the Court requiring the NRC to obey its own rules with regard to compliance with the "as low as practicable" requirements and with regard to the NRC and utility (also Philadelphia Electric Co.) being required to bear the "burden of proof," which, with the approval of the Licensing and Appeal Board, the Intervenors had been required to bear. In addition, the Court noted in its decision

> ...it would be unrealistic to expect public interest litigants to underwrite the expense of mounting the kind of preparation and presentation of evidence that is ordinarily required in this type of case (York Committee for a Safe Environment v. U.S.N.R.C., D.C. Cir., Dec. 9, 1975, at n. 13).

In 1973, I filed an intervention petition in opposition to the two 1160 Megawatt High Temperature Gas Reactors planned for the Fulton site (on the Susquehanna River opposite Peach Bottom 2 and 3) also proposed by Philadelphia Electric. This project was abandoned prior to construction, although it lingers on under the guise of "Early Site Review." In May of 1974, I began my long involvement in the operating license process for Three Mile Island, Unit 2, which, as you may be unaware, has not yet been completed by the NRC. In cases (Kepford, pro se, v. U.S. NRC) currently being held in abeyance by the U.S. Court of Appeals for the District of Columbia Circuit, the legality of the operating license for TMI-2 is being questioned. Two major unresolved issues of TMI-2 safety and environmental impact are under review by the NRC; nonetheless, the reactor was allowed to operate and to experience the nation's worst commercial nuclear accident.

The TMI-2 accident has spawned a number of reviews. The President ordered one review, called herein (for the sake of brevity), the Kemeny Report. Subsequently, the NRC commissioned its Special Inquiry Group study directed by Mr. Mitchell Rogovin, which I call the NRC SIG Report.

This latter study group was staffed largely by personnel "on loan" from the NRC itself, and thus may not be considered an entirely independent study. In addition, the NRC has conducted a number of fully "in house" reviews and investigations. These have resulted in the publication of the following reports:

1. "TMI-2 Lessons Learned Task Force Status Report and Short-term Recommendations," NUREG-0578, July, 1979.
2. "Investigation into the March 28, 1979, Three Mile Island Accident by the Office of Inspection and Enforcement," NUREG-0600, August, 1979.
3. "TMI-2 Lessons Learned Task Force Final Report," NUREG-0583, August, 1979.
4. "Report of Special Review Group, Office of Inspection and Enforcement on Lessons Learned from Three Mile Island," NUREG-0616, December, 1979.

I would be thoroughly delighted to be able to report to this Subcommittee that as a consequence of the TMI accident the industry and the NRC have learned enough to significantly increase the general level of safety of all U.S. nuclear power plants. But, drawing on my extensive participation in both past and ongoing NRC licensing cases, including TMI-2, TMI-1 Restart, and Susquehanna 1 and 2, I must regretfully report that the opposite is true.

This depth and period of involvement since 1972 and my intimacy with the licensing process have forced me to make a list of "real" lessons learned from the TMI-2 accident. These lessons would be vehemently denied and denounced by the NRC and the industry, but I firmly believe that the overwhelming amount of evidence supports my views. In short, I fear that the TMI-2 accident has given the NRC a green light to continue its business as usual attitudes, but now with a real vengeance toward dealing with those who have opposed nuclear power in the past.

1. The public cannot be told the truth about emergency preparedness around any nuclear power plant.

The TMI-2 accident vividly demonstrated that the sweeping assurances of safety, emergency preparedness, response capabilities at all levels, and offsite monitoring, all offered under oath by witnesses for the NRC, Commonwealth, County and Met Ed, were erroneous, totally speculative and, in short, false. Since then the NRC has apparently come to the realization that some kinds of serious accidents may take place so fast (that is, fast enough to cause large radiation exposures within up to 12 hours) that evacuation is impossible. Thus, the affected populace need not be told that an accident is in progress. This is evident upon a close inspection of "Draft Emergency Action Level Guidelines for Nuclear Power Plants," NUREG-0610, Sept., 1979. Here one sees that there is no requirement for notification of the public until a "Site Emergency" has already been declared. At this point, the situation is already serious and may well rapidly be deteriorating to catastrophic.

The exposures to be allowed the public in the event of a "General Emergency" are nothing short of criminal and represent the utter contempt and disregard of the NRC for the health and safety of the public.

In continuance of the traditional policy of the NRC's Atomic Safety and Licensing Boards of the past to exclude from litigation any issue which, if aired at all, might force the Board to reach a negative decision on the issuance of an operating license for a commercial reactor, the TMI-1 Restart licensing board has "cleansed" our emergency preparedness contention (See Attachment 1) of those issues that would prove troublesome if aired in litigation. We sought to investigate the NRC's and utility's assumptions behind the various aspects of their emergency preparedness and evacuation plans. However, such discussion now may well have to await the next nuclear catastrophe, since every contention questioning any underlying assumption was excluded by the licensing board. In this attachment, those contentions stricken by the Board are marked with an asterisk. We have also attached the rulings of the Board on those issues on which the Board wished to commit itself (See Attachment 2).

With regard to the general subject of emergency preparedness, the TMI-2 accident causes, in my mind, some serious reservations about the ability of any efforts to prevent unwanted exposure to those who don't want it, in the event of the next accident.

First, somewhere between three and six hours elapsed between the commencement of this first-ever loss of coolant accident (LOCA), and the first emissions of radioactive gases from the accident. But for the traditional belief of the NRC and nuclear industry that serious accidents won't ever happen, preparations for evacuation could have been undertaken in that time.

Secondly, it was around eleven hours after the accident began before high release rates were reached, release rates which, in retrospect, should have warranted evacuation. According to a report by a Met. Ed contractor, Pickard, Lowe, and Garrick (Report #TDR-TMI-116), at around 3:00 p.m., March 28, 1979, the release rate was about 280,000 curies per hour, or a few dozen times the expected annual release rate. The releases, it is believed, peaked around midnight with a release rate of about 180 curies per second, or around 650,000 curies per hour. From 5:00 p.m. Wednesday until 6:00 a.m. Thursday, March 39, 1979, the prevailing winds blew from the south southeast (8 hours), the south (one hour), the southeast (2 hours), and the east southeast (3 hours); in fact, in the general direction toward the capital city of Pennsylvania, Harrisburg.

Third, when the concern arose over the hydrogen bubble and a possible core meltdown, over two full days had elapsed since the accident began. Still, with the two full days already wasted with regard to evacuation planning, time was short. Evacuating 250,000 to 650,000 persons is no simple task, but the magnitude of the unpreparedness of all organizations was appalling.

Unfortunately, there is no assurance whatsoever coming from the NRC that the next accident will unfold as slowly as did the most unusual kind of accident at TMI-2. As mentioned above, it appears that the NRC knows that under most serious accident scenarios, meaningful evacuation is impossible. But the main option -- stay inside with the windows shut -- does not necessarily solve any problems. Quite the contrary, it may lead to an evacuation under conditions where the inhalation of particulates may be far worse than the gases avoided by staying indoors. But, we do know that we cannot even discuss these issues at the TMI-1 Restart hearings, since the licensing board in that proceeding has already covered the NRC and Met. Ed by excluding these very matters from litigation. To date, it has eliminated from the proceeding the ECNP contentions(#15 and 37, pp. 9 and 13 resp., Attachment 1) which would have dealt with the varying time-frames for possible accident scenarios. This is just one aspect of a real NRC licensing board in action. This is the real world of NRC licensing wherein the health and safety of the public is totally subordinated to the health of the nuclear industry.

In this same vein, I wish to point out that all references to the need for providing accurate, factual, and timely information to the public were also excluded by this licensing board. Why? We ask the Congress for a full investigation of the NRC's abuses of its own regulatory licensing function. An investigation carried out now might ensure an honest and open operating license hearing in the Limerick case, when and if these reactors ever reach that stage. If that were to take place, it would be, in our opinion, the first honest NRC proceeding in history. But unless the Congress forces drastic reforms on the agency, I assure you that NRC hearings on Limerick will be as much of a sham as have been all previous NRC license proceedings, and the residents of Montgomery, Bucks, and Chester Counties, and all of the Philadelphia-Trenton metropolitan region will live with an even worse threat of nuclear disaster than the people of TMI.

2. The protectionist and promotionist attitudes of the NRC staff toward the nuclear industry can continue indefinitely.

   Corollary 1. The NRC staff will cover for and protect the industry right up to its last hour of operation.

   Corollary 2. The public can continue to be given only information which would cause them to support the NRC and industry.

While some of the findings of the Kemeny and Rogovin Commissions have received a lot of attention (such as creating a "strong" chairman of the NRC), I feel the most important findings have been totally ignored by the press, Congress, and practically everyone else.

For instance, the following paragraphs appear in the "Warning" section of the Overview of the Kemeny Commission's Main Report:

> But we have an overwhelming concern about some of the reports we have seen so far. While many of the proposed "fixes" seem totally appropriate, they do not come to grips with what we consider to be the basic problem. We have stated that fundamental changes must occur in organizations, procedures, and, above all, the attitudes of people. No amount of technical "fixes" will cure this underlying problem. There have been many previous recommendations for greater safety for nuclear power plants, which have had limited impact. What we consider crucial is whether the proposed improvements are carried out by the same organizations (unchanged), with the same kinds of practices and the same attitudes that were prevalent prior to the accident. As long as proposed improvements are carried out in a "business as usual" atmosphere, the fundamental changes necessitated by the accident at Three Mile Island cannot be realized. (p. 24-5)

These strong words came in part from Finding 12 of the Kemeny Commission concerning the NRC, which simply states

> With its present organization, staff, and attitudes, the NRC is unable to fulfill its responsibility for providing an acceptable level of safety for nuclear power plants. (p. 56)

The NRC SIG came to very similar conclusions:

> However, the work done by the Special Inquiry Group over the past 7 months has led us to conclude that unless fundamental changes such as those outlined above are made in the way commercial nuclear reactors are built, operated, and regulated in this country, similar accidents-- perhaps with the potentially serious consequences to public health and safety that were only narrowly averted at Three Mile Island-- are likely to recur.
>
> It is, lest we forget, an inherently dangerous activity that Congress has authorized the NRC to license.

> What we are able to conclude confidently, based upon the work of the Special Inquiry Group, is that while the changes that must be made are major ones, these changes will make commercial nuclear power much safer than it is today. In our view, if a firm commitment is not made promptly to bring about these changes, we will be exposing the public to a needlessly high level of risk.
>
> Finally, we believe a summary comment is called for with respect to the recommendations made by this and other inquiries. Over the years the nuclear industry and its regulators have identified what have been considered to be serious safety problems and recommendations whose significance has been underscored by ringing statements to the effect that unless such problems are resolved "promptly," a license should be revoked or the industry shut down. Many of these problems are still outstanding. While we do not undertake to set out deadlines, we do believe that the congressional oversight committees should hold the NRC accountable with respect to such issues. (pp. 91-3)

The strong language in these reports should leave little doubt in any reader's mind that both review groups found serious problems with the attitudes of the personnel in the NRC itself.

Yet business goes on as usual in the NRC, with certain exceptions. These exceptions are troubling in the extreme:

(a) The NRC has moved to cut off the flow of information to individuals engaged in NRC licensing proceedings. This denial of vitally important and necessary information has involved different approaches. First, all NRC-produced documents (like the NUREG documents cited above) are no longer available free of charge to licensing participants. Rather, they must be purchased from NTIS at outrageous prices (or from the NRC, at comparable prices). For citizens' groups like ours, these high prices, when combined with the very large number of such documents that are needed in a licensing proceeding, render the documents unavailable. As a result, our participation in the proceedings is a sham, from which virtually no positive contribution can be made. This policy, I must add, was instituted after the TMI-2 accident (See Attachment 3).

(b) Secondly, documents are denied to us by the NRC staff even when legitimately sought through the quasi-legal "discovery" process. Prior to the TMI-2 accident, few requests were ever denied in any of the NRC license proceedings in which ECNP groups have participated. Since the TMI-2 accident, few have been granted. In the Susquehanna 1 and 2 licensing proceeding, we were told by an NRC staff attorney that "the providing of free documents of the numerous documents listed, no less than the providing of free copies of the transcripts, would be financial assistance and is prohibited by current Commission policy (Letter from James M. Cutchin, IV to Dr. Judith H. Johnsrud, Sept. 13, 1979).

In the TMI-1 Restart proceeding, we have been totally denied every single document we requested which pertained to the TMI-2 accident. Our lists of requested documents were either selectively lost or totally ignored, despite the repeated promises of the NRC staff attorneys to comply with such requests.

(c) Thirdly, since the TMI-2 accident, the NRC staff and the utilities have abruptly changed their tactics so as to further imbalance the already ludicrous evidentiary records in licensing proceedings. The new tactic is to ask hundreds and literally thousands of interrogatories of our group as intervenors. The purpose, of course, is to sufficiently tie up the time and energies of all available intervenor personnel so that the intervenors are unable to prepare their own cases. In this endeavor, the Staff and utilities have enormously succeeded, with the acquiescence of the licensing boards. Of course, even when the interrogatories have been timely answered, the response of the Staff and utility recipients is: the Intervenors' answers are "evasive,""unresponsive," and "inadequate," so all questions must be reanswered. And the licensing boards so order. Needless to say, without blind, incompetent, biased, or otherwise inattentive licensing boards, such one-sided attacks on public-interest intervenors would be impossible. In both the Susquehanna Operating License and TMI-1 Restart proceedings, the licensing boards have been enormously cooperative -- with the NRC staff and utilities. Yet again, in the very important TMI-1 Restart case, the licensing board threatens us with expulsion if we cannot answer interrogatories, but turn a blind eye toward the refusal of Met. Ed. to supply documents and toward the broken promises of the NRC staff to fulfill discovery requests.

In short, however bad the NRC licensing system was before the accident, it is much worse now.

3. In its licensing process, the NRC is free from interference by the courts.

In a decision in 1978, the Supreme Court stated

> Nuclear energy may someday be a cheap, safe source of power or it may not. But Congress has made a choice to at least try nuclear energy, establishing a reasonable review process in which courts are to play only a limited role. The fundamental policy questions appropriately resolved in the Congress and in the state legislatures are not subject to reexamination in the federal courts under the guise of judicial review of agency action. Time may prove wrong the decision to develop nuclear energy, but it is Congress or the States within their appropriate agencies which must eventually make that judgment (Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, U.S. Supreme Court, Slip Opinion, pp. 35-6, April 3, 1978).

In my opinion and in my experience, the NRC has used these words in this decision, in combination with the TMI-2 accident, to launch an all-out assault on citizen intervenors. The intent, I feel, is to so thoroughly harrass and exhaust them that they withdraw in weary defeat or are expelled from a proceeding for default or failure to satisfy impossible demands placed upon them. In these cases, since the "administrative remedies" have not been completed, the courts will not interfere. Since the TMI-2 accident, we have been totally innundated with the time-consuming paper work of responding to demands for filings by the utilitites, the NRC staff, and licensing boards. We have been required to furnish information by licensing boards, but these same boards deny us access to information. Extensions of time for filings have been denied us, even when proceedings coincide. Intervenor funding is again denied by the NRC, and by this Committee. Every conceivable impediment is thrown in our way to keep us from being able to formulate, much less properly prepare, a case on matters affecting our members' and our own health and safety. In fact, there is not a shred of either fairness or integrity in the NRC licensing system. Unsafe reactors and inadequate regulation of the nuclear fuel cycle -- and accidents far worse than the one at Three Mile Island -- will be the result, if Congress does not undertake a real reform, rather than the kinds of retrogressive licensing legislation that have been considered year after year. It has been, after all, only external pressures by citizens and independent analysts that have brought improvements in reactor safety, not internal ones.

4. Reactor safety has not been sufficiently improved. For any operating reactor or reactor under construction, there is no capability of containing a core meltdown, should one occur.

In terms of reactor accidents to date, the TMI-2 accident is clearly the worst. Approximately one half, or maybe two-thirds, of the core inventory of all noble gases at shutdown were eventually released into the containment structure. A similar but perhaps smaller fraction of iodine isotopes was released also, but the vast majority stayed in the water released from the reactor the first week. Perhaps a few percent of the isotopes of cesium and barium were released to the water also, and less yet of strontium-90. But things could have been much worse.

Had the core melted (and the NRC-SIG suggests TMI-2 might have come within 30 to 60 minutes of a meltdown), virtually all isotopes would have been released to the reactor building atmosphere. All noble gases, all iodines, all cesiums, and many others would be immediately released to the containment atmosphere. Others might be more slowly vaporized from the molten mass, condensing out somewhere above the mass, either on a surface or as particulates in the air. In reality, the ambient radiation levels might reasonably be expected to be much higher than at any time at TMI-2.

Yet the past and existing radiation levels are being used by the NRC as at least part of the justification for the immediate venting of the krypton-85 now contained at TMI-2:

> The building's air-cooling system's fans were qualified for 3 to 4 hours of continuous operation in a 100% relative humidity environment. They have been operating nearly continuously since the March 28, 1979 accident in a high-humidity environment. Therefore, these fans can reasonably be expected to fail at any time. Their failure would result in a decrease of heat removal from the reactor building atmosphere which would in turn cause the atmospheric pressure in the reactor building to increase and become positive relative to the outside atmosphere. (NUREG-0662, pp. 4-3, 4-4)

Part of the mythology which surrounds and supports nuclear power plants is that a properly built containment structure can "contain" a core meltdown. However, if there is the threat of loss of building seals after the TMI-2 accident, then any hope of containing a full core meltdown should be quickly discarded. To the best of my knowledge, this subject has yet to be discussed openly and publicly in any NRC forum. Needless to say, when ECNP tried to raise this all-important issue in the TMI-1 Restart Proceeding, we were turned down by the Board.

5. When the next serious accident occurs, the public will only learn the truth after the fact, if then.

It takes very little time at all perusing either the Kemeny Commission Report or the NRC SIG Report to learn that both of these groups concluded that both the utility and the NRC were unable to provide the public and the media with accurate, timely information on TMI-2 accident (See Kemeny Commission Report, pp. 57-8; NRC-SIG Report, pp. 156-7). The utility had spent years telling the neighbors of TMI how safe and clean nuclear power was (at the rate-payers' expense). Every effort was taken by the company to control the flow of information concerning nuclear power in Central Pennsylvania so that only favorable information about TMI and nuclear power reached the media. The company did not hesitate at all to use its political power to stifle dissenting views. When the accident began, the flow of information and misinformation from Met. Ed. represented the "image first, truth last" attitude of the company.

Neither Met. Ed. nor the NRC made any reference to release rates of radioactive materials during the early days of the accident. Part of the reason was because all the in-plant vent monitors were off-scale for days. Yet no attempts appear to have been made to try to determine what these release rates were. And, neither Met. Ed. nor the NRC appears to have told anyone about the off-scale state of the plant vent monitors for weeks or months after the accident began.

As the days passed during the early stages of the accident, radiation exposures of the close-in neighbors were compared to a mere chest x-ray or up to 2 or 3 chest x-rays. Yet many important considerations were omitted.

First, in the public discussions relating radiation exposures to some number of x-rays, no mention was made that mass x-ray screening programs have largely been abandoned in the U.S. It has been concluded that such programs were, at best, only of marginal utility, since x-rays do cause harm and no exposure to radiation is truly "safe."

Secondly, there was no discussion as to the need for irradiating all members of society -- children, adults, the chronically ill, the institutionalized, and, worst of all, the unborn. By the time the partial evacuation was recommended by Governor Thornburg, most of the radioactive materials had already been released from the reactor.

But the most tragic, I feel, has been the degree of manipulation of the monitoring data and health effects calculations by virtually all "official" reviews of the data. Here I refer to the May 10, 1979, report of the Ad Hoc Population Dose Assessment Group, all discussions by both the Kemeny Commission and NRC-SIG group, and subsequent discussions by the NRC, and, quite recently, the Pennsylvania Department of Health. All of these discussions and reports suffer from one or more of the following serious defects:

(a) All discussions assume the response of an exposed population is uniform. Yet it is known that the response of individuals to radiation varies, since the human species is not a homogeneous mass, but rather a heterogeneous mixture.

(b) Health effects (meaning cancers) calculations are based on inappropriate standards and inappropriate studies. The results of the studies of the atomic bomb victims bear no demonstrable applicability to relatively low dose and low dose-rate exposures; yet those results form the basis of existing radiation standards.

> (c) None of the studies of exposures from the accident have discussed the quality of the available monitoring data, the sparseness of the data, the reliability of the data, the applicability and accuracy of the meteorological models used in computations. In short, none of the studies has yet revealed any complete sensitivity analyses of the complete methodology or expressed a full and complete set of confidence limits on the exposures estimated.

In short, there appears to be a massive effort to down-play the possible health effects of the TMI-2 accident. No "official" source has yet issued an evaluation of the releases and monitoring data which could be called a critical review. Instead, all support the "popular" conclusion that the health effects were minimal.

Yet many troubling aspects remain. Dr. Ernest Sternglass has suggested that there has been a significant increase in infant mortality in the Harrisburg area, in Pennsylvania, and in the Northeast as a result of the accident. In its hasty rebuttal, the Pennsylvania Department of Health has adjusted its data to fit its own predetermined conclusions. The Department of Health singled out the area within 10 miles of the plant, so as to exclude Harrisburg. Harrisburg has a large population of blacks, which, the "official" reasoning went, would tend to skew the results, since blacks in the U.S. have a higher infant morality rate than do whites. Such reasoning is faulty for a number of reasons.

First, in the first three days of the accident, the wind was blowing in the general direction from TMI to Harrisburg more than in any other general direction, as was described earlier. As a result, exposures in the Harrisburg area should have been higher than in other areas at the same distance from TMI. But, of course, there were insufficient monitors in place in that time period to detect what exposures actually were at almost any point beyond 2 or 3 miles from TMI. As a result, infant mortalities from Harrisburg are indeed the most relevant.

Secondly, since Sternglass used infant mortality data from the month immediately before the accident for comparison with data after the accident, the suggested higher infant mortality of the black population of Harrisburg would not skew the results at all, except to accentuate any change from previous months.

And lastly, the use by the Pennsylvania Health Department of the black infant mortality rate also would imply a sudden influx of blacks into Harrisburg to so suddenly skew the infant mortality data. No such sudden influx of (pregnant) blacks into Harrisburg immediately after the TMI-2 accident has been reported.

In summary, the Pennsylvania Department of Health is showing far more loyalty to a predetermined position than it is toward an honest and open discussion of the consequences of the TMI-2 accident.

It should also be noted that the controversy over the health effects of the TMI-2 accident (and, for that matter, of the health effects of the normal operation of all nuclear power plants) is due in large part to the continuing refusal of the NRC to ever do base-line study of the health of a population prior to the operation of a nuclear facility. The absence of this base-line data, along with the relatively primitive level of health data gathering capabilities in most states, denies epidemiologists the information needed to honestly and scientifically settle the controversy.

It does appear to this individual that the NRC and the nuclear industry have adopted from the Viet Nam War whatcan only be referred to as a "body count mentality." By this I mean that unless some member of the public can gather together at one time enough dead bodies which can unequivocally be related to some nuclear mishap, the industry and the NRC will forever issue blanket denials of any causal relationship between nuclear power plants and subsequent casualties.

I must also point out here that the vast majority of documents I have requested of the NRC staff in the TMI-1 Restart proceeding deals with various aspects of the accident -- monitoring data, core inventories, accident probability estimates, consequence calculations, meteorological data, and so on. The purpose is to try to attempt to check out the hastily drawn NRC conclusions. It is just this data which the NRC staff so steadfastly refuse to produce. And it is none other than the TMI-1 Restart Proceeding licensing board which has, to date, protected the Staff and continues to harrass ECNP with threat of dismissal from the proceeding unless we respond to Discovery, while the Staff is not equally required to do so.

It should now be evident that, as presently staffed, the NRC will protect the nuclear industry right up until the last hour of operation of the industry. That last hour, I feel, will be when the demonstrable "body count" from an accident convinces even the totally dedicated pro-nuclear NRC staff personnel that nuclear power is indeed dangerous. Deaths from latent cancers or genetic damage will, of course, never be assessed against reactors, since the individual victim cannot prove the causal relationship many years following a radiation exposure. How many Americans must die between now and that catastrophic accident as a result of the nuclear industry is not known, and is, perhaps, not knowable.

At the present time, nuclear power generates only about 13% of our nation's electricity. There is no better time than the present to pause to have a thorough review of the nuclear energy program, prior to any increased dependence on this inherently hazardous method of boiling water. We do not have, after all, any other source of boiling water which has so many unsolved problems. Nor do we have any other method of boiling water which entails the largely unknown risks to the present and all future societies as nuclear power. Nor do we have any other methods of boiling water which have had the backing of virtually the entire infrastructure of industry, academia, and, of course, government, or which have been funded so completely with tax money. And yet the industry still demands subsidies, such as increased investment tax credits (to build more, unneeded facilities); tax financed construction of Away-From-Reactor spent fuel storage facilities and waste disposal facilities; future remedial repair work on mill tailings to be disposed of; and, of course, all of the obvious and not-so-obvious subsidies associated with the Price-Anderson Act.

Both the Kemeny Commission and the NRC-SIG issued calls and warnings to Congress to exercise the lawful Congressional oversight over the NRC and the industry. I can only repeat these calls. It is time the Congress demanded high levels of performance from the NRC and industry. It is time Congress acted to protect the health and safety of the public since the NRC continues to fail to do so. It is also time the Congress removed from the U.S. Atomic Energy Act of 1954, as amended, all language which can be construed as requiring the U.S. Government to promote the use of nuclear power here and abroad. The present system, after all, cannot be self-correcting. Rather, like any and all bureaucracies, it can only be self-protecting. As some wise man reputedlysaid, "War is too important to be left to the generals." If indeed war is too important to be entrusted solely to those whose lives are dedicated to the study (and practice) of war, it may also be reasonably expected that nuclear power is too important to be left to those whose lives have been dedicated to the belief that nuclear power is safe and necessary.

Attachment 1

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of METROPOLITAN EDISON COMPANY (Nuclear Generating Station, Unit 1)	Docket No. 50-289 License Suspension Proceedings

ECNP INTERVENORS' REVISED CONTENTION ON EMERGENCY PREPAREDNESS AND EMERGENCY RESPONSE

ECNP hereby submits its revised contention on emergency preparedness and emergency response for possible acceptance as an issue in controversy by the Licensing Board. The bases for those contentions for which external bases are needed are listed at the end of the revised contention. The bases are listed as references without additional explanation. These bases are so listed because of the short time period available for reviewing one complete "Metropolitan Edison Company Emergency Plan for Three Mile Island Nuclear Station, Unit 1"(the Plan). This effort was hampered by the fact that the suspended licensee (Metropolitan Edison Company, or Met. Ed.) has not provided the parties with Appendix A to the Plan, which is the implementing document for the Plan.

With regard to the implementing document, ECNP objects to the procedures recommended by the suspended licensee. (Licensee's Response to Emergency Planning Contentions, Jan. 2, 1980, at n. 5.). Here, it is suggested that the implementing document be reviewed "outside the hearing process by the Staff." ECNP submits that for a subject as important and as complex as emergency planning and preparedness, especially in the light of the sorry state of preparedness at the TMI-2 accident, open review of the implementation procedures for the emergency plan is called for to protect the public interest. Such a cozy and closed review of matters of vital concern and importance to the public, as suggested by the suspended licensee would do little to rebuild public confidence in the suspended licensee or the regulatory agency.

The sole justification offered by the suspended licensee for its cloak of secrecy is that the "implementing procedures always have been reviewed by the Commission Staff." The failures of the normal review process of the Commission Staff are detailed in numerous of the Technical Staff Reports and the Report of the President's Commission on the Accident at Three Mile Island itself. In fact, as the President's Commission found

> With its present organization, staff, and attitudes, the NRC is unable to fulfill its responsibility for providing an acceptable level of safety for nuclear power plants. (Report, p. 56).

Since there is nothing in the implementing procedures that is proprietary, it would certainly be in the public interest to have an open review of this important subject.

* ECNP contends that the emergency plan of the suspended licensee is totally inadequate to protect the health and safety of the members of the potentially affected public in the event of a radiological emergency at TMI. The plan is filled with promises of things to be done in the future, expectations of smooth, unimpeded operation, and is devoid of contingency plans or even the justifications for the few assumptions that are given. However, one extremely serious deficiency of the plan is that it is nothing but a plan. There is no assurance provided that this plan will be any more workable than the original TMI-2 emergency plan. Until it has been realistically tested, its efficacy can only be considered speculative. Another serious deficiency is that notification of the public that an accident is in progress and that local radiation exposure rates are rising is delayed, and then notification only takes place after the information has passed through a number of levels of corporate and political bureaucracy. In addition, the Plan offeres no assurance that the information released to the public will be accurate, complete, candid, honest,

and timely, and devoid of political tampering or modifications designed to satisfy corporate public relations purposes rather than the public's need for full and reliable information.

But the most troubling aspect is the subtle underlying assumption that permeates the entire plan, which is that the members of the public do not have the fundamental right (legal, moral or ethical,)

(a) to be informed that they are being or are about to be exposed to radiation dose rates much higher than the normal background rate, and,

(b) to be allowed to make their own decisions as to what level of unwanted, unnecessary, and unjustified radiation exposure (for which they receive no commensurate benefit whatsoever) they deem acceptable and what level of exposure they deem unacceptable for themselves and their children, and,

(c) to act accordingly, even if that means to vacate the area themselves at the first occurrence of trouble, if they so desire.

The TMI Plan implies throughout that the affected populace should simply sit tight in ignorance of events that might threaten their health or their lives and await word of their fate from far-away bureaucratic "authorities." ECNP contends that this plan should not be deemed acceptable until these major deficiencies are corrected such that

(a) live drills, including evacuation, are carried out in the areas potentially affected by accidents at TMI;

(b) the public can be guaranteed that it will receive accurate, candid, honest, complete, and timely notification of unplanned radioactive releases as soon as or before they actually occur (should such information be available to plant operators);

(c) the public can ge guaranteed that it will receive accurate, candid, honest, complete, and timely notification of accidents and of the course of accidents from their inception;

(d) the right of those members of the public who wish to avoid exposure to accidental releases of radioactivity or the releases of radioactivity occurring during accidents is recognized, honored, protected, and guaranteed.

ECNP further contends that the plan is based on numerous assumptions (only six of which were deemed by the suspended licensee of sufficient import to acknowledge, and these do not appear until Appendix D (p. 4) of the TMI Plan) which receive no discussion as to their validity. ECNP below presents a list which ECNP believes comprises the major assumptions behind the TMI-1 Emergency Plan.

1. Accurate predictions can be made concerning the probability of occurrence and temporal distribution of reactor accidents, and also the period of danger or period of greatest concern during a reactor accident.
2. The inadequacies of emergency planning and response at all levels during the TMI-2 accident can and will be prevented from recurring at the next accident at TMI.
3. There will be no sabotage at any nuclear power plants and in particular at TMI.
4. Evacuation planning and preparedness around TMI can be limited to some arbitrary distance from the nuclear reactor.
5. The next serious accident at TMI will occur only after all emergency planning and all emergency preparations have been complete.
6. Instrumentation exists in TMI-1 to give the plant personnel accurate, unambiguous information so that the reactor operators can
   (a) react and respond intelligently and correctly to prevent core damage, and
   (b) accurately and in a timely manner inform plant management and all other officials of current plant conditions.
7. Reactor operators are sufficiently well trained such that when an unanalyzed, unanticipated accident, like that at TMI-2 does occur, operators will not be confused, and will know which instruments and indicators in the control room to rely upon to prevent core damage.
8. The control room is designed to minimize confusion at the time of an accident, and is designed to inform the reactor operators of the necessary information with a priority over less important or relevant information.
9. The designated employees of Met. Ed. can be trusted to transmit accurate and complete information in a timely fashion to the potentially affected public and officials.
10. The NRC will transmit information openly and accurately and in

a timely manner to the public throughout the emergency.

11. The State will transmit information openly and accurately and in a timely manner to the public throughout the emergency.

12. No political pressure will be applied to encourage any involved organization to down-play the severity of the accident or conceal some relevant component of information about events at TMI and their effects.

13. The members of the affected or potentially affected public do not have either the right to or the need for accurate and timely information throughout an emergency at a nuclear power plant.

14. The members of the affected public will not panic when informed that large releases of radioactive gases (10^4 Ci Xe^{133}) have already taken place during another accident at TMI.

15. Members of the affected or potentially affected public have neither the need nor the right to be able to take actions on their own to prevent unwanted exposures to radiation at levels which the NRC and other governmental agencies deem to be acceptable (as in NUREG-0610 and NUREG-0396).

16. Evacuation, in the event of another accident at TMI, can be counted on as a general procedure to reduce (but not eliminate) elevated exposures even though

    (a) much time will have already been wasted by Met. Ed. prior to alerting the public to the accident (no notification of the public in Unusual Event and Alert categories); and

    (b) there may not be enough time for members of the public to carry out their necessary domestic functions, including but not limited to

        (1) collecting necessary documents, such as deeds, insurance policies, birth certificates, and so on,
        (2) turning off gas, oil, electricity, and closing windows, locking house, etc.
        (3) gathering all non-school family members (off shopping, etc.).

    (c) no consideration has been given to the care of farm animals in areas where owners might be expected to evacuate;

    (d) no consideration has been given to the time required to evacuate the affected institutionalized individuals (hospitals, prisons, etc.);

    (e) little or no consideration has been given to the method of evacuation of individuals without cars;

    (f) no consideration has been given to the availability of gasoline;

(g) no consideration has been given to the amount of cash on hand which the evacuees may have for their own support for an unknown length of time.

17. The offsite radiation levels which might occur at TMI prior to the public announcement of an emergency and radiation levels prior to and during evacuation as described in NUREG-0610 constitute acceptable levels of exposures to the affected members of the public even though

    (a) such levels of exposure do not take into account the variability of humans of all ages to the effects of radiation; or

    (b) the increased average sensitivity of children to radiation; or

    (c) the greatly increased average sensitivity of the developing fetus to radiation;

    (d) prior exposures of residents in the vicinity of TMI.

18. Both State and local officials around TMI are capable of evacuating all who need evacuating, and

    (a) there will be enough cars, buses, etc. for everyone;

    (b) roads will not be jammed to the stalling point;

    (c) there will be no gas shortages, and

    (d) all necessary volunteer emergency personnel will be available for duty and will continue to be available and to respond adequately to orders through the duration of the evacuation.

19. Members of the affected public do not need to be told that the main justification for their being ordered to stay indoors during an emergency may well be that they cannot be evacuated.

20. If orders are given for the members of the public to close windows and stay indoors, conditions at the plant will not change so as to make these orders a mistake, or that members of the public will be properly and timely informed to take other precautions.

21. If there is a reactor core meltdown, and the containment does not rupture early in the accident, then all is well, and there will be no need for further concern.

* ECNP submits that the TMI Plan should be deemed unacceptable until these and any and all other assumptions upon which the Plan is based are thoroughly discussed and evaluated as to their validity in public adjudicative proceedings.

ECNP further contends that the Plan, including its various parts and appendices, contains a large number of serious deficiencies, inconsistencies, and inaccuracies, which render the Plan questionable in its utility, purpose, and workability. These deficiencies are enumerated below.

*1. The "prime objectives" of the plan are said to be (p.2-1) to provide a "means for mitigating the consequences of emergencies" and to provide "implementing procedures" to ensure preparedness.[1] Yet no discussion is offered as to the degree of consequence mitigation offered for protective measures possible and the array of accidents from which the public is to be protected.

2. The TMI Plan is said to be based on a 10 mile radius, (p. 2-5) and that the plan is coordinated with all five counties within that radius (p. 2-7). Yet all five of the counties have emergency plans which are based on 5, 10, and 20 miles radii from TMI.

*3. The suspended licensee states it has developed an "Emergency Public Information Plan." Yet the suspended licensee has not offered a single reason why anyone should believe any statements from the suspended licensee. This problem is obliquely recognized in the Public Information Plan, pages 10-11, but neither the cause nor the solution of the problem appears in the Plan.

4. The Plan provides "a means for classifying emergency conditions in a manner compatible "with various State and County organizations (p. 3-1). Yet the Commonwealth and the five counties use different classification schemes.

*5. The Plan counts on "training, drills, reviews, and audits" (p. 3-2) to result in emergency preparedness. However, there is no amount of training, etc., that cannot be rendered ineffectual by licensee management, once the license suspension has been lifted.

*6. The accident and conditions listed for the various emergency categories are nothing but a rehash of the FSAR accidents. Not only is the TMI-2 accident not listed, the broader scope of accident analyses recommended in NUREG-0578 (p. A-42-5) is ignored completely as are the Alternate Event Sequences of the Technical Staff Analyses Report of the President's Commission.

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[1] ECNP notes here that ECNP has not received Appendix A to the Plan, which is the Implementation Document for the Plan. ECNP submits that this plan should be made available to the parties of this proceeding for their perusal well prior to the start of the TMI-1 Restart Hearings. Only in this way can the proper public scutiny of the complete emergency plan be made.

7. The fractions of the EPA PAGs listed on p. 4-1 of the Plan are illustrative of the utter contempt and disdain felt toward the neighbors of TMI by the management of the suspended licensee. The fractions represent large doses to the thyroids of children and fetuses, and at 50 mR/hr to this gland, represent dose rates to be avoided. Yet in the "Alert" category, Met. Ed., the suspended licensee, does not even provide for disseminating the news of the current conditions to the public.

8. The fractions of EPA PAGs listed on p. 4-1 of the Plan, with their associated action levels, do not take into account the total accumulated dose and dose commitment. As a result, the total exposures may exceed by large margins the listed PAG fractions prior to the advancement to a higher emergency category.

9. The various emergency categories (p. 4-2 to 4-8) each list a number of triggering events or conditions. Many of these are questionable indicators. For instance, on p. 4-3, "Valid" alarms are referred to. But there is no mention of the definition of a "valid" alarm, or what would be an invalid alarm. A number of reactor coolant activities (50, 130, and 300 ci/ml) are referred to, but no mention is made of how much full damage it takes to produce these readings. In addition, there is no indication of how or how rapidly these coolant activities will be determined.

10. Reliance on "adverse meteorology" (p. 4-5, 4-6), can prove to provide little or no "built-in conservation" (p. 4-7, 4-8) since, for instance, such conditions were not at all uncommon during the nighttime in the nights following the TMI-2 accident (for instance, the night of March 29, from 10 pm to 8 am, March 30; night of March 31, about 8:00 pm to 8 am, April 1.)

11. The Plan lists a series of accidents from the FSAR for TMI-1 and instrumentation to detect the condition or accident. However, it does not appear that the radioactive gas monitoring devices are of sufficient range to prevent the condition that prevailed at TMI-2, namely, monitors off-scale high.

12. The "General Emergency" category (p. 4-7) acknowledges that the lower limits of the PAGs (1 rem whole body or 5 rem thyroid exposures, p. 4-1) are likely to be exceeded. Not only does this represent an outrageously high exposure to those most sensitive individuals of all ages, it does not even represent the total dose received. As stated on p. 1-4, "The protective action guide does not include the dose that has unavoidably occurred prior to the assessment." Emphasis added. ECNP submits that the occurrence of an "unavoidable" dose is due solely to the refusal (or inability) of the suspended licensee to provide the public with timely, accurate, honest and complete information concerning the course of the accident. ECNP submits that this contemptible disregard for the health and safety of the public in and of itself is sufficient grounds to render the entire plan unacceptable.

13. ECNP submits that reliable assessments of offsite conditions and dose rates cannot be made from the TMI site without an extensive array of live, real time, offsite radiation detectors. The Plan admits to the possibility of off-scale monitors with the expectation of using "contingency dose release factors". Contingency dose release factors are, however, not defined. This eventuality, along with the complexities of offsite dose projections and estimations from inside the site and the associated errors and opportunities for miscalculation under emergency conditions render offsite detectors a necessary safety device. Furthermore, live , offsite detectors could have direct output terminals at various State and County sites, and thereby bypass the cumbersome time-consuming reporting procedures outlined by the suspended licensee.

*15. The overall Plan suffers from serious defects, including but not limited to:

(a) The Plan offers no understanding of different time factors for unfolding of accidents, changing conditions during accidents, and so on,

(b) The Plan has no contingencies if all operations, equipment, etc. don't function exactly as planned.

(c) The Plan is exceedingly cumbersome, with much more attention being paid to Met. Ed.'s "public image" than to the protection of the health and safety of the public, or even to the release of accurate, honest, complete and timely information to the public.

*16. The Offsite Emergency Support Organization (p. 5-10, Fig. 13) offers little substance or assurance to the plan since it suffers from having been put to the test at TMI-2 and found sorely wanting. There, for example, it was shown that, with regard to the first five "responsibilities" listed on p. 5-10, the Organization was hopelessly incompetent.

*17. Workers in normal and emergency conditions, including temporary workers, are not given objective or even factual information about the risks of radiation doses to which they may be exposed.

*18. The assessment actions for the General Emergency are based on whole body and thyroid dose for accidents as specified in TID-14844 and assume engineered safety features are operable (p. 6-6). ECNP submits that TID-14844 is out of date (pubalished in 1962) and must be updated. In addition, such reliance is inconsistent with the "General Emergency" conditions, where, as noted on page 4-7, the possibility of multiple loss of engineered safety features is implied. Loss of containment integrity implies loss of other engineered safeguards previously. As a result, any reliance on the curves in Fig. 21 & 22, and the assumptions therein (Fig. 23), may lead to a gross underestimation of offsite doses, and, hence, of consequences. ECNP notes that the fact that the TMI-2 containment structure now reportedly contains 44,000 curies of Kr^{85}, over 50% of the core inventory, demonstrates the inadequacy and inconsistency of the assumptions upon which the Plan is based.

*19. Table 12 does not list the needs for more adequate training of all reactor operators in accident understanding and response, a matter observed as being inadequate in the Report of the President's Commission on the Accident at Three Mile Island, pp. 49-50.

20. The REMP of the Plan is only slightly less inadequate than the grossly inadequate REMP prior to the TMI-2 accident. In particular, the new REMP envirsions only 2 TLDs in each 22.5° compass sector, one at the site boundary and one 4 or 5 miles from the site. This approach in the Plan implies a dedication to continued use of meteorological models to project doses in situations where such models are known to be inadequate and/or inapplicable (complex topography, long distance-a few miles, and so on.)

*21. The Plan relies on "drills and exercises" to give the impression of emergency preparedness. Yet the Plan offers no assurance that just the conducting of drills of licensee employees and governmental officials, and volunteers once a year or once every five years (p. 8-5 through 8-8) will actually result in real emergency preparedness.

*22. The "Emergency Public Information Plan," Appendix B to the Plan, reflects the dedication of the suspended licensee to pay for more attention to nurturing its public image than to provide accurate, candid, honest, and timely information to the public. This is revealed in the purpose of the "Information Plan," pp. 4-5. "The stated objective of the plan is prompt, complete, and consistent dissemination of information," (See also, pp. 10-11) Yet the Plan then sets up an elaborate, cumbersome, multi-step, hierarchical information manipulation scheme (see pp. 24-6) with the major emphasis on "a *single* company voice" (emphasis in plan, p. 5). The Plan itself defeats the prompt dissemination of information, and contains no mention whatsoever of any need for or intent to provide *accurate* information. The stated need for "a *single* company voice," with the time-consuming steps necessary to achieve this goal of questionable value during an accident, outweighs the need for timely and accurate information in the priorities of the suspended licensee, and this judgment results in what the suspended licensee refers to as "the dose that has unavoidably occurred"to the public (Plan, p. 1-4).

*23. The abbreviated descriptions of emergency classifications in Appendix B (p 9) mention "actual or imminent core degradation or melting with potential for loss of containment integrity." This result would appear to correspond to that general accident category known as Class 9 accidents which may have resulted from multiple plant failures. The Plan contains no discussion of the routes to this end result. Nor does the Plan discuss the long-term fate of the components, electrical and mechanical, inside the containment structure in the event of a core meltdown, and the public health and property consequences of a reactor with a melted core. The plan makes no mention of how long containment integrity can be maintained post-accident, or what are the consequences of containment failure at some future time.

*24. The "Information Plan" contains no mechanism whereby a member of the public can obtain directly from the suspended licensee information which he (or she) can be assured will be accurate, candid, honest, and timely. The TMI-2 accident illustrated the vast ability of this suspended licensee to distribute inaccurate, incomplete, misleading, wrong, and out-of-date information. Appendix B of the Plan remedies none of these demonstrated deficiencies of this suspended licensee or its emergency plan.

*25. ECNP submits that Appendix D of the TMI Plan and Annex E of the Pennsylvania Disaster Plan (Annex E) shares many of the inadequacies of the TMI Plan. However, in contrast to the TMI Plan, Annex E does reveal six assumptions upon which it is based, but offers no discussion as to the validity of the assumptions.

26. Annex E is internally inconsistent. It assumes there will be adequate time to implement the provisions of the plan, including evacuation (p. 4) but then admits than notification times "following an incident may vary" (p. 7). Yet no discussion is offered as to how much notification time would be available for the range of accidents for which planning must be based, or how much time would be required to carry out an evacuation, or what contingency plan and procedures may be needed.

*27. Like the TMI Plan (with Appendix B), Annex E contains no provisions for assuring that accurate, candid, complete, and timely information will, or even can, be disseminated to the public (see Annex E, Appendix 5).

28. Appendix D of the Plan contains reference to the need for the decontamination of radiologically contaminated individuals (p. 16) but does not provide any information as to how many people may be contaminated, the kind and degree of contamination expected or to be planned for, or the number of facilities and medical personnel appropriately trained in decontamination and radiation injury treatment techniques which may be necessary.

*29. Appendix D suggests the possibility that members of the Armed Forces may be needed for use in the event of an accident. No assurance is offered that these largely volunteer members will not be exposed to large doses of radiation. Nor is there any assurance that these troops will be monitored for radiation exposure or that, if they are exposed, their health will continue to be monitored throughout and past the length of the cancer latency period or the period of genetic damage.

30. The REMP of the TMI Plan (see #18, above) runs the risk of being totally inadequate to measure off-site exposures in the event of a "puff" or series of "puff" releases. The small number of dosimeters at the 4-5 mile distance from TMI leaves the vast majority of the region at these distances totally unmonitored, since the width of the "puff" may well be very small compared with the distance between these distance detectors. As a result, the probability is high that a plume can pass undetected. As a result, substantial exposures may well occur, but go essentially unrecorded. The situation is worse yet at further distances, where the level of monitoring is greatly

diminished, even though there is [illegible] need for dosimeters at larger distances to confirm the applicability of meteorological models.

31. Appendix D assumes that in the event of another accident at TMI, a trade-off is to be made between some alleged social disruption due to evacuation and population exposure mitigation. Such an assumption blames the process of evacuation itself for the alleged social disruption while ignoring the fact that the cause of the need for evacuation, and hence the cause of any associated social disruption is the nuclear power plant. This assumption also assumes that the social disruption due to evacuation in the event of a nuclear accident is greater than the social disruption in the event of a nuclear accident without evacuation. These assumptions and conclusions are without basis or justification.

32. Appendix D of the TMI Plan assumes the availability of lead time to effectuate the Plan (p. 4). However, Appendix 8 of that Plan which is the BRH Plan, assumes the event itself will, among other things, dictate the time available (p. VII-1). This fundamental inconsistency mandates the need for all assumptions of each and every component of the entire plan to be revealed and to have the validity of each assumption fully assessed.

33. The BRH plan (Appendix 8) relies on the infant thyroid dose (1.5 rem) as the dose from milk ingestion to be avoided (p. IX-4). This does not take into account the fetus, whose sensitivity may greatly exceed that of the infant. In addition, the value of 1.5 rem to the thyroid from milk ingestion does not take into account the inhalation exposure. (See #8 and 11, above).

34. The BRH method of assessing exposures to the infant thyroid by the cow-milk pathway is ultimately based upon the dose conversion factors found in Reg. Guide 1.109. Reliance upon these dose conversion factors in the event of an emergency at TMI may lead to actual exposures many times larger than obtained by Reg. Guide 1.109 dose conversion factors. (See ECNP Contention 3, Oct. 5, 1979, and the related discussion at the Special Prehearing Conference, November 14, 1979, page unknown, because these Intervenors thus far have not been granted access to transcripts.) Similar considerations apply to the Protective Action Guides for food (p. IX-8).

35. The BRH plan (Appendix 8) states that "the Governor's Press Secretary will be the single centralized point for release of public information to the news media..." if the State plan is to be activated. However, the Lancaster County Plan (April 8, 1979, addition), for example, states that the responsibility for "preparing and issuing all emergency public information within the county..." lies with the Lancaster Emergency Management Department.

36. ECNP contends that the routing of all information through the Governor's Press Secretary to the public adds unnecessary complexities to the entire plan. For example, since the Press Secretary of the Governor can reasonably be expected to be a political appointee and not necessarily knowledgeable at all in the area of nuclear accidents and their consequences, or the nature of radiation injury, the designation of the Governor's Press Secretary as the official and sole spokesperson adds one more pathway for and perhaps impediment to information in the cumbersome and circuitous route between an event or accident at TMI and the public. There is no need for this extra step. In addition, this extra step offers one more opportunity for errors and omissions to be introduced into the information and only adds further delay. It [illegible] expected [illegible] this extra step will result [illegible] removal

of errors from the messages. Furthermore, the possibility exists, with this extra, unnecessary step, for political pressure to be brought to bear to alter, delay, or even withhold crucial information from the public.

*37. The Dauphin County Plan (Appendix E of the TMI Plan) contains a statement by Representative Stephen R. Reed, Chairman, Disaster Servcies Committee, Harrisburg River Rescue, Inc., which states that "It may take 10 or 20 hours to evacuate the entire city. It is my understanding that we will receive at least a 48 hour notification to evacuate." Here again is a fundamental inconsistency concerning the time available for evacuation (see #24 and 29, above). ECNP reiterates its contention that until all assumptions behind the entire Plan are revealed and the validity of these assumptions is fully assessed, the Plan in its entirety must be regarded as wholly unacceptable.

38. The evacuation plans for Cumberland, York, and Lebanon Counties are based, at least in part on the assumption that many if not most, evacuees will stay with friends or relatives outside the evacuation zone. This assumption is highly questionable, since during the early days of the still-ongoing TMI-2 accident, after women and children were ordered out of the area within five miles of TMI, many tens of thousands of people outside this area themselves evacuated voluntarily. In the event of another accident at TMI which causes a twenty mile evacuation, for which each of the five counties expresses preparedness, the resultant voluntary evacuations of persons beyond the 20-mile radius might well mean that there will remain no friends and/or relatives for the 20 mile evacuees to reside with temporarily.

*As a result of the above inaccuracies, inconsistencies and deficiencies, ECNP submits that no evacuation plan can be devised which will prevent large numbers of the residents within any given radius of TMI from receiving unaccepted exposures to radiation[2] should the kinds of accidents occur at TMI which "involve actual or imminent substantial core degradation or melting...and/or loss of Reactor Building (containment) integrity." (TMI Plan, p. 4-7, emphasis in the original). ECNP contends that the only sure method of ensuring the protection of the health and safety of the public from a utility that, even after four and one half years of operating TMI-1, "did not have sufficient knowledge, expertise, and personnel to operate (TMI-2) and maintain it safely." (Report of the President's Commission on the Accident at Three Mile Island, p. 44), is to permanently suspend the operating license for TMI-1, and to order the complete

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[2] Here, unacceptable exposures are any above the EPA PAGs. Of course, it is acknowledged that many individuals regard such exposures as totally unacceptable.

decommissioning of the TMI-1 and TMI-2 nuclear power reactors.

BASES AND REFERENCES

Number 10. **"Assessment of Offsite Radiation Doses from the Three Mile Island Unit 2 Accident," Pickard Lower, & Garrick, #TDR-TMI-116. See Rable A-3 for the days listed in the contention.**

Number 11. **"TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations" NUREG-0578.. See pages A-36 through A-40.**

Number 16. **See, in general, "Report of the President's Commission on the Accident at Three Mile Island."**

Number 19. **Same as No. 16, see pages 49-50.**

Number 20. **Workbook of Atmospheric Dispersion Estimates" USEPA AP-26. See p. 40.**

Number 26. **Reactor Safety Study, WASH-1400, Appendix VIII, p. VIII-11 to 16.**

Number 31. **"Three Mile Island Telephone Survey" Draft Report. NUREG-CR-1093. See Table II-5.**

Number 34. **See Contention 3, Oct. 5, 1979 of ECNP and "Radioecological Assessment of the Wyhl Nuclear Power Plant", NUREG-TR-520.**

In the present absence of the necessary substantiations of the assumptions underlying the Emergency Plan,the information essential to further articulation of the bases of these contentions is lacking. In the absence of the Suspended Licensee's Appendix A Implementation Plan for the Emergency Plan, the ECNP Intervenors cannot here provide additional explication of the bases of these contentions beyond those statements incorporated in the contentions listed above taken in conjunction with the references here cited.

Respectfully submitted,

January 7th, 1980.

Chauncey Kepford

Chauncey Kepford
Representative of Intervenors
433 Orlando Avenue
State College, Pennsylvania
(814) 237-3900

Attachment 2

ECNP Contention No.:	Ruling
2-1	Rejected for lack of basis.
2-2	Accepted, but ECNP will be required to provide more specificity following discovery.
2-3	Rejected. It is a generalized attack on licensee's credibility, and is too broad to be litigable.
2-4	Accepted but ECNP will be required to provide more specificity following discovery.
2-5	Rejected. It is a sarcastic reference to licensee's management in a form that cannot be litigated. Licensee's management capability, of course, is a mandatory issue in the proceeding and will be litigated in other contentions.
2-6	Rejected for inadequate bases and bounds. This contention faults the emergency plan because ECNP is not satisfied with the accident bases. The board discussed its reasons for rejecting this form of emergency planning contention in its Third Special Prehearing Conference Order (pp. 5-7) with respect to UCS's Contention 16.
2-7	Accepted, but limited to ECNP's assertion that licensee's plan for informing the public of possible releases is inadequate.
2-8 through 2-10	Accepted.
2-11	Accepted. Although the board indicated in its interim order on emergency planning contentions that this contention was rejected, the board has now reconsidered and accepts the contention. It relates to emergency monitoring equipment going off scale, and it is similar to Newberry's Contention 3(d)(3) which the board has accepted.

ECNP Contention No.:	Ruling
2-12	Rejected as beyond the scope of the proceeding.
2-13	Accepted.
2-14	Omitted.
2-15	Rejected. Lacks basis and specificity.
2-16	Rejected. Lacks factual basis.
2-17	Rejected. Lacks factual basis and its relevance to the proceeding is not clear.
2-18	Rejected. The adequacy and status of TID-14844 is not in issue in this proceeding.
2-19	Rejected as lacking in specificity. However the adequacy of operator training will be litigated as a mandatory issue in the proceeding.
2-20	Accepted. No objections.
2-21	Rejected. No basis.
2-22	Rejected. No basis, argumentative and without specificity.
2-23	Rejected. The contention assumes that the Emergency Plan must discuss a range of accident scenarios. This was disposed of in our ruling on UCS's Contention 16 as we stated with respect to Contention 2-6, supra.
2-24	Rejected. This contention raises the issue of direct public access to information from licensee which can be trusted to be accurate, candid, honest and timely. ECNP then, without elaboration, alleges that the "... TMI-2 accident illustrated the vast ability of this suspended licensee to distribute inaccurate, incomplete, misleading, wrong, and out-of-date information." We reject this contention for lack of

ECNP Contention No.:	Ruling
	basis and specificity, and because the remedy sought by ECNP is not indicated. However, the Board itself will expect the evidence on emergency planning to address whether or not the information upon which the Emergency Plan depends will be trusted and whether there is reasonable assurance that the affected public will rely and act upon it. ECNP and other intervenors with emergency planning contentions may participate in this aspect of the proceeding.
2-25	Rejected. ECNP challenges the assumptions underlying the Pennsylvania Disaster Plan but does not explain why.
2-26	Accepted without objection.
2-27	Rejected. Argumentative and without basis.
2-28	Accepted without objection.
2-29	Rejected. It refers, inter alia to the cancer latency period of genetic damage to members of the armed forces and is beyond the scope of the proceeding.
2-30	Accepted without objection, but consolidated with Contention 2-20.
2-31	Rejected. It raises no litigable issue.
2-32	Rejected. This contention challenges all assumptions of each and every component of the entire Emergency Plan. It is lacking in specificity and reasonable bounds.
2-33	Accepted without objection.
2-34	Rejected. Dose conversion factors are beyond the scope of the proceeding.

ECNP Contention No.:	**Ruling**
2-35	**Rejected. It does not raise a litigable issue nor is the relevance of the observation apparent.**
2-36	**Accepted.**
2-37	**Rejected. This is an unlimited and unspecified challenge to the entire Emergency Plan.**
2-38	**Accepted without objection.**

Newberry Intervenors

Attachment 3

Federal Register / Vol. 44, No. 152 / Monday, August 6, 1979 / Notices [illegible]

UCLEAR REGULATORY COMMISSION

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The Commission will continue to participate in the National Technical Information Service Program. Individuals or organizations may continue to purchase NRC documents at NTIS subject to NTIS procedures and prices.

Dated at Bethesda, Maryland, this 23rd day of July, 1979.

For the Nuclear Regulatory Commission.

Daniel J. Donoghue,

Director, Office of Administration.

[FR Doc. [illegible] Filed [illegible]]

BILLING CODE 7590-01-M

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
SECRETARY

September 19, 1979

Dear Recipient of Commission Issuances:

Our records indicate that the Office of the Secretary has been routinely providing you or your firm copies of all Commission issuances (Orders, Decisions, Notices and other papers).

Commission and Hearing Board issuances are served on all parties to a proceeding in accordance with appropriate regulations. In addition, a practice has developed over the years of providing free copies of all Commission and Hearing Board issuances to a number of local attorneys, news services, industry representatives, and others. The practice has become costly, it is burdensome in terms of personnel resources, and we are considering its discontinuance.

Consideration is being given to limiting distribution of free copies to newspapers, periodicals, clearing houses and/or reporting services. Issuances will continue to be available in the Public Document Room for reading and if personal copies are desired they can be obtained through arrangements with the commercial contractor in the PDR who will reproduce the documents at the prevailing price. This change will have no effect on the present system of serving the parties to a proceeding as now required by 10 CFR Part 2.

Under the more restrictive criteria set forth above, you would no longer be eligible to receive routine distribution of Commission issuances. In order to fully assess the impact of the contemplated changes, we are asking recipients to submit their views, if they so wish, to include reasons for continued exemptions by September 30, 1979.

Sincerely,

Samuel J. Chilk

Samuel J. Chilk
Secretary of the Commission

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAY [illegible] 1980

Dear Participant:

Please allow this letter to inform you that the Trial Program, which provided free copies of certain documents to participants in on-going NRC proceedings, terminated as of March 1, 1980. During the month of March, requests which meet the criteria established for free documents will be filled. After that time, requests will be returned for proper payment.

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FEB 25 1980

PETER H. KOSTMAYER
8th District, Pennsylvania

Congress of the United States
House of Representatives
Washington, D.C. 20515

February 20, 1980

Dear Mo:

Pursuant to our conversation today I am requesting that the Subcommittee on Energy and the Environment hold a field hearing in my district on the feasibility of federal and state emergency planning for the partially completed nuclear plant at Limerick, Pennsylvania.

I would also urge the subcommittee to consider a second hearing on the feasibility of converting the plant to coal.

I have asked Herb Sambol of my staff to contact the subcommittee to discuss this in further detail.

I would sincerely appreciate your consideration in this matter.

With every good wish.

Sincerely,

Honorable Morris K. Udall
Chairman
Committee on Interior and Insular Affairs
1324 Longworth HOB
Washington, D.C. 20515

ENV SBCTE
SES/mer
NUCLEAR: invite to Limerick field hearing

April 16, 1980

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

The Interior Subcommittee on Energy and the Environment will conduct a field hearing on emergency planning and economic issues surrounding the Limerick nuclear power plant, now under construction in Montgomery County, Pennsylvania. The hearing will be held on May 27, 1980, at the Bucks County Community College, Newtown, Pennsylvania, commencing at a time to be announced.

On behalf of the Subcommittee, I would like to invite you to appear before our panel to testify on the following issues:

1. Adequacy of emergency planning procedures and emergency preparedness, and

2. Implications of "lessons learned" from the accident at Three Mile Island.

Subcommittee staff will contact your office for further consultation and is available to provide you with whatever assistance may be required.

I thank you in advance for your cooperation.

Sincerely,

MORRIS K. UDALL
Chairman

Editor's note: Similar letters were sent to other witnesses.

MAY 13 1980

FEDERAL EMERGENCY MANAGEMENT AGENCY
Washington, D.C. 20472

MAY 9 1980

Honorable Morris K. Udall
Chairman, Subcommittee on Energy and
 the Environment
Committee on Interior and Insular Affairs
House of Representatives
Washington, D. C. 20515

Dear Mo:

Thank you for your letter of April 16, 1980, concerning a field hearing to be held on May 27 by the Interior Subcommittee on Energy and the Environment at the Bucks County Community College in Newtown, Pennsylvania, on emergency planning and economic issues surrounding the Limerick nuclear power plant.

Due to previous commitments, I regret that Frank Camm, Bob Ryan nor I will be able to attend the hearing. However, Mr. John McConnell, my Assistant Associate Director for Population Preparedness, Plans and Preparedness, will be available to testify. Mr. McConnell is extremely knowledgeable on the adequacy of emergency planning procedures and emergency preparedness. Also, representatives from our Regional office in Philadelphia, who work on a daily basis with the Pennsylvania Emergency Management Agency, will be available to answer questions.

Your interest in the Federal Emergency Management Agency is appreciated.

With best wishes,

Sincerely yours,

John W. Macy, Jr.
Director

APR 28 1980

York County Emergency Operations Center

COURT HOUSE
YORK, PENNSYLVANIA 17401

April 23, 1980

The Honorable Morris K. Udall, Chairman
Committee on Interior and Insular Affairs
U. S. House of Representatives
Washington, D. C. 20515

Dear Sir:

This is in reference to your April 16, 1980 invitation to Mr. Leslie Jackson to appear before the Interior Subcommittee on Energy and the Environment field hearing on emergency planning issues surrounding the Limerick Nuclear plant on May 27th.

Mr. Jackson has recently retired as Director of the York County Emergency Management Agency and will not be available as requested.

Although I am at your disposal for any information or assistance that you may require, my recent appointment and lack of first hand experience associated with the Three Mile Island accident unfortunately disqualifies me from appearing in Mr. Jackson's stead.

Sincerely,

Randy L. Curry
Director

MAY 2 1980

MAY 2 1980

PHILADELPHIA ELECTRIC COMPANY
2301 MARKET STREET
P.O. BOX 8699
PHILADELPHIA, PA. 19101
(215) 841-4000

V. S. BOYER
SR. VICE PRESIDENT
NUCLEAR POWER

April 29, 1980

The Honorable Morris K. Udall
Chairman
Committee on Interior and Insular Affairs
U. S. House of Representatives
Washington, DC 20515

Dear Chairman Udall:

Philadelphia Electric Company will be pleased to participate in the May 27, 1980 hearing of your Subcommittee on matters relating to Emergency Planning and Economic issues associated with our Limerick Generating Station. Mr. Gilkeson has asked me, as the senior corporate officer responsible for our nuclear projects, to respond to your letter and to appear before your panel to testify on the designated issues. As requested in your letter, Mr. R. H. Logue, Engineer in Charge, Nuclear Environmental Section, will also appear with me.

I am attending the Nuclear Power Assembly in Washington on May 7 and 8, and will be visiting various elected officials on the afternoon of May 7. In fact, I have a scheduled meeting with Congressman Kostmayer who, I understand, will be conducting the hearing for your committee, at 2 pm on the afternoon of May 7. It would appear appropriate at that time to discuss further details relating to the forthcoming May 27 hearing. If the Subcommittee staff wishes to contact me prior to my meeting with Congressman Kostmayer, I would be pleased to hear from them as it is entirely possible that I could also meet with them during a free period on the afternoon of May 7.

Sincerely,

V S Boyer

cc: R. F. Gilkeson

PETER H. KOSTMAYER
8TH DISTRICT, PENNSYLVANIA

Congress of the United States
House of Representatives
Washington, D.C. 20515

June 4, 1980

Dear Mr. Chairman:

On May 27, the Subcommittee on Energy and the Environment held a day-long field hearing in Newton, Pennsylvania to review emergency planning and evacuation procedures in the area of the Limerick nuclear power plant currently under construction by the Philadelphia Electric Company in Limerick Township, Montgomery County, Pennsylvania.

The Subcommittee received testimony from Mr. Harold Denton, head of the NRC's Office of Nuclear Reactor Regulation. Mr. Denton reiterated the basic thrust of the Commission's proposed rule on emergency planning, and stated in part:

> Our current approach places significantly increased emphasis on emergency planning as a necessary additional measure required for the protection of public health and safety. . . Probably the most influential development is an explicit consideration of the total spectrum of potential radiological accidents. Formerly the planning process has been based only on a limited portion of the spectrum -- to accidents of severity up to and including the most serious design basis accident. Now, the planning process has been expanded to include core melt accidents. (emphasis added).

But under questioning by us at the same hearing the Philadelphia Electric Company demonstrated considerable antipathy to a number of the NRC's safety policies . currently under consideration. According to Vincent Boyer, Senior Vice President of the Company,

> Evacuation plans are just the window dressing and the final back-up plan.

Mr. Boyer further contended that the Low Population Zone (LPZ) for Limerick of 1.7 miles was "more than adequate" for the purposes of evacuation planning, even though the concept of the LPZ has been completely discredited by Congressional and independent studies, and has been replaced by the Emergency Planning Zone (EPZ) by the NRC. For Limerick, the 10 mile EPZ contains almost a quarter of a million people. But Mr. Boyer said, "We don't think the 10 mile region is that populous." Mr. Boyer perhaps best summed up the position of the Philadelphia Electric Company by stating, "Emergencies that will require evacuation will not occur."

We hope he is right. But it is this very attitude which has been abandoned by the NRC and we think it should be abandoned by the industry as well. The fact that Mr. Boyer and his company still hold this view does nothing to reassure us or the almost 4 million people living within 30 miles of the plant.

It is our belief that the protection of the public health and safety depends to a great extent on the attitudes and commitment on the part of the managers of the nuclear power industry. The enormous complexity of nuclear technology and the demands of day-to-day plant operations cannot be assured by a mere regulatory code. Rather, as the President's Commission on the Accident at Three Mile Island concluded:

> We have stated that fundamental changes must occur in organizations, procedures, and above all, in the attitudes of people. No amount of technical "fixes" will cure this underlying problem. . . As long as proposed improvements are carried out in a "business as usual" atmosphere, the fundamental changes necessitated by the accident at Three Mile Island cannot be realized.

The issue of licensee attitudes was also raised at a second hearing on May 29 of the House Government Operations Subcommittee on the Environment, Energy, and Natural Resources, on the NRC's new Performance Assessment Board (PAB) program. Representative Kostmayer, who chaired the hearing, referred to the Boyer testimony, and asked Mr. Victor Stello, Director of the NRC's Office of Inspection and Enforcement, whether or not evidence of a utility's attitude obtained from a Congressional hearing could be included in the NRC's assessment of the utility's ability to comply with NRC's safety regulations. Mr. Stello replied, "It certainly whets my appetite for wanting to know more about it. . . if we had that problem I would want very quickly to have a chat with one of the senior officials of that company. . . probably very quickly."

In view of the fact that the Philadelphia Electric Company is planning to have Limerick Unit 1 on-line by 1985, we share the concerns expressed by Mr. Stello. We therefore request that the NRC seriously consider the attitudes expressed on May 27 by Philadelphia Electric and determine whether or not the Company's permit for the construction of a nuclear power plant at Limerick is consistent with the public health and safety.

We look forward to your reply.

Sincerely,

Peter H. Kostmayer Edward J. Markey

Peter H. Kostmayer Edward J. Markey

Mr. John F. Ahearne
Chairman
Nuclear Regulatory Commission
Washington, D.C. 20555

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CHAIRMAN

August 20, 1980

The Honorable Peter H. Kostmayer
United States House of Representatives
Washington, D.C. 20515

Dear Congressman Kostmayer:

On June 4, 1980, you and Congressman Markey wrote to me expressing concern about oral testimony on emergency planning given on May 27, by Mr. Vincent Boyer, Senior Vice President, Nuclear Power, of the Philadelphia Electric Company, before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs. In replying to you on June 30, Mr. William Dircks, Acting Executive Director for Operations of the Nuclear Regulatory Commission, mentioned arrangements for a meeting with Mr. Boyer by Mr. Harold Denton, Director of the NRC Office of Nuclear Reactor Regulation, to discuss this matter in greater detail. That meeting was held on June 30, 1980 and was attended by both Mr. Denton and Mr. Victor Stello, Director of the NRC Office of Inspection and Enforcement.

Based on this meeting, it appears that Mr. Boyer recognizes the importance of emergency planning to public safety and has committed to assuring that all management levels of the Philadelphia Electric Company have a sincere and apparent commitment to effective emergency protective measures. A copy of the July 15, 1980, letter to Mr. Denton from Mr. Boyer is enclosed. In the letter Mr. Boyer states that he has reiterated to the management of the Departments at the Philadelphia Electric Company the importance of emergency planning as a protective measure in maintaining the health and welfare of the general public and that this position has the support and approval of the President of the Company.

We shall continue to monitor the actions taken to make sure that they comply with the requirements of the Nuclear Regulatory Commission.

Sincerely,

J F Ahearne

John F. Ahearne

Enclosure:
Letter dtd July 15, 1980
to Mr. Denton from
Mr. Vincent Boyer

PHILADELPHIA ELECTRIC COMPANY
2301 MARKET STREET
P.O. BOX 8699
PHILADELPHIA, PA. 19101
(215) 841-4500

V. S. BOYER
SR. VICE PRESIDENT
NUCLEAR POWER

July 15, 1980

Mr. Harold Denton
Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20555

Dear Mr. Denton:

I was pleased to have the opportunity to meet with you on June 30 to clarify the statements made by me at the hearing held in Newtown, Pennsylvania on the subject of emergency planning for the Limerick Generating Station.

Congressmen Kostmayer/Markey's letter states that "It is our belief that the protection of the public health and safety depends to a great extent on the attitudes and commitment on the part of the managers of the nuclear power industry." In fact, this commitment has been the overriding philosophy of Philadelphia Electric Company since its entrance into the nuclear power field in the late 1950s. Safety has been an overriding concern in all of our activities related to our nuclear facilities.

The Kostmayer/Markey letter excerpted a statement made by me at the hearing which led to a misimpression of my views. More than four pages of my testimony cover the important area of emergency planning and concludes with the statement, "Our goal is to have an emergency plan which is responsive to the most recent NRC criteria, which is fully coordinated with the Pennsylvania Emergency Management Agency and County plans and which utilizes the experience gained at Peach Bottom. Further, while we believe that the conservative design of the plant, its extensive safety features, and the operation of the plant by well-trained personnel will preclude the need to ever fully utilize the plan, we will be ready, with trained personnel, to fully implement the plan for the protection of employees and the public." My complete testimony was delivered to every Company employee during the week following the hearing.

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Mr. Harold Denton - 2 - July 15, 1980

I have reiterated the importance of emergency planning as a protective measure in maintaining the health and welfare of the general public to the management of the Electric Production and Engineering & Research Departments. My message has the support and approval of our Company President, Mr. J. L. Everett, and he has personally reviewed this matter with the Vice Presidents of the departments involved in our nuclear activities.

Sincerely,

Vincent Boyer

JUN 4 1980

DAN GLICKMAN
FOURTH DISTRICT—KANSAS

COMMITTEES:
AGRICULTURE
SCIENCE AND TECHNOLOGY

NATIONAL ALCOHOL FUELS
COMMISSION

MYRNE ROE
ADMINISTRATIVE ASSISTANT
BILL BEACHY
EXECUTIVE ASSISTANT

CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
WASHINGTON, D.C. 20515

1507 LONGWORTH BUILDING
WASHINGTON, D.C. 20515
(202) 225-6216

U.S. POST OFFICE AND COURT HOUSE
BOX 403—ROOM 224
WICHITA, KANSAS 67201
(316) 262-8396

407 WOLCOTT BUILDING
201 NORTH MAIN
HUTCHINSON, KANSAS 67501
(316) 669-9011

June 3, 1980

John Macy, Director
Federal Emergency Management Agency
1725 "I" Street, Northwest
Washington, DC 20472

Dear Mr. Macy:

During a recent hearing of a House Interior Subcommittee held in Bucks County, Pennsylvania, which I attended and which related to evacuation plans in the event of a nuclear power disaster, there was considerable testimony as to FEMA's role in coordinating federal evacuation efforts in the event of a nuclear power plant disaster.

At the hearing, Harold Denton of the Nuclear Regulatory Commission indicated that FEMA had been selected as the chief coordinating federal agency to insure that there were adequate federal, state and local evacuation plans in the event of such a disaster and that the NRC, under a proposed rule, would not issue an operating license for a nuclear power plant unless FEMA had made the determination regarding evacuation plans. Your agency has a critical role in the licensing process of nuclear plants and yet John W. McConnell, Assistant Associate Director of Population Preparedness of FEMA, seeming to rely on the fact that your agency was new, did not appear to be able to answer certain basic questions regarding FEMA's ability or authority to handle this task.

Accordingly, I would very much appreciate it if you would answer the following questions for me which I do not believe Mr. McConnell could answer.

1. How much money was allocated in your Fiscal 1980 budget for activities associated with the preparation and implementation of evacuation plans for nuclear power plants?

2. How much money is so allocated in your Fiscal 1981 budget?

THIS STATIONERY PRINTED ON PAPER MADE WITH RECYCLED FIBERS

3. How many employees do you expect to have in 1981 directly involved with these evacuation plans?

4. Are these new employees, or have they been reassigned from other activities, such as civil defense? If they have been reassigned from civil defense, have you filled these vacated civil defense positions and if not, do you expect to?

5. Do you expect to complete your examination of current state evacuation plans by June 30, 1980, and what do you intend to do with the results of your examination?

6. Do you currently have formal arrangements or agreements with the NRC, state civil defense agencies, or any existing public utilities operating nuclear power plants, regarding the operation or implementation of evacuation plans? If so, could you provide me a general description of these arrangements?

I would also appreciate a copy of your submission to the relevant Senate and House appropriations committees detailing your 1981 appropriation requests.

I do not mean to unduly hassle you by this letter and the questions contained therein. However, my feeling after participating in this hearing is that your agency must be capable of performing the functions assigned to it by the President, or else the American people are being misled as to the integrity of this government's promises after Three Mile Island.

Yours very truly,

Dan Glickman

Dan Glickman

DG:mb

cc: Honorable Morris Udall, Chairman, House Interior Committee
Honorable Peter Kostmayer, Member, House Interior Committee

FEDERAL EMERGENCY MANAGEMENT AGENCY
Washington, D.C. 20472

JUL 8 1980

Honorable Dan Glickman
House of Representatives
Washington, D.C. 20515

Dear Mr. Glickman:

I am replying to your letter of June 3, 1980, concerning the Federal Emergency Management Agency's (FEMA) ability or authority to handle radiological emergency preparedness. I will respond to your questions in the order presented.

1. There are no funds in the FEMA Fiscal Year 1980 appropriation specifically for the preparation and implementation of evacuation plans for nuclear power plants. Prior to December 7, 1979, FEMA's involvement in this program was only incidental, i.e., in general support of the Nuclear Regulatory Commission's (NRC) assigned responsibilities. On December 7, 1979, the President responded to the recommendations of his Commission on the accident at Three Mile Island (Kemeny Commission Study and Report). The President directed FEMA to take the lead in all off-site preparedness efforts and encourage and assist State and local governments in accelerating their planning for emergency incidents. To support these activities, the President submitted an $8.9 million supplemental appropriation to Congress. The House Appropriations Committee has recommended an amount of $1.9 million. The Senate Appropriations Committee did not recommend any funds for this purpose. However, in conference the Senate acceded to the House and appropriated the $1.9 million. Enclosed please find a breakout of the expenditures which will be made of these funds (Enclosure 1).

2. None. Our FY 1981 budget request was submitted prior to the December 7, 1979, assignment by the President. Future funding of this activity is being discussed with the Office of Management and Budget.

3. Approximately 66 employees are and will continue to be directly involved in radiological emergency preparedness activities. This includes 11 staff detailed from NRC, 5 clerical and technical FEMA support staff, and 50 FEMA Regional staff. Our Public Affairs and Training and Education offices and other FEMA supervisors are also devoting a substantial amount of time to this activity, in addition to their other duties.

4. We have offered permanent FEMA employment to the detailed NRC staff. If anyone declines FEMA's offer, the position will be filled by recruit action. Under FEMA's concept and approach to comprehensive emergency management, Regional staff are cross trained and use their

skills in all aspects of emergency preparedness from civil defense to disaster response and recovery. Many of the skills and systems needed for civil defense are applicable to radiological emergency preparedness, for example: evacuation, planning, communications and warning requirements, etc.

Approximately 130 Nuclear Civil Protection Planners, who are State employees hired under contract with Federal funds, are temporarily diverted to radiological emergency preparedness at the request of the particular States involved. Requests by States to continue to use these planners during FY 81 for nuclear power plant emergency planning will be considered on a case-by-case basis.

5. Our review of the status of planning and preparedness in each State has been completed. We submitted a report to the President on planning status on June 30, 1980. The report will be available to the States and the public.

6. We have an agreement with the NRC - Memorandum of Understanding Between NRC and FEMA to Accomplish A Prompt Improvement in Radiological Emergency Planning and Preparedness, dated January 14 - copy enclosed. (Enclosure 2). The enclosed Proposed Rule on the Review and Approval of State and Local Radiological Emergency Plans and Preparedness delineates FEMA's responsibilities in this activity (Enclosure 3).

The answer to your questions may make it appear that our effort to improve emergency preparedness around nuclear power facilities may not be as dynamic as it could be. However, I would like to assure you that a great deal of staff effort and emphasis is being applied.

Please keep in mind that the specific planning must be done by the State and local officials who are directly responsible for the health and safety of their people and who have direct control over the resources to carry out emergency plans. There is no Federal law nor Federal executive directive which requires them to produce such plans. Our role is to provide technical guidance and such assistance as is available.

I feel that substantial progress is being made, with the limited resources available. I will be pleased to forward a copy of the report to the President within the next few days. This will provide information on all aspects of the problem which may be of interest to you. I am also submitting a copy of our FY 1981 appropriation request (Enclosure 4).

If I can be of further assistance, please let me know.

Sincerely yours,

John W. Macy, Jr.
Director

Enclosures

Federal Emergency Management Agency

FY 1980 Supplemental Request

Radiological Emergency Preparedness

President's Budget Request	$ 8,900,000
House Action	1,900,000 no
Senate Action	-0-

Additional Travel for FEMA - $225,000. The heavy regional component of FEMA's REP involvement necessitates a request for an additional $225,000 in travel funds in the current year, particularly for our regional office staff who are providing direct technical and planning assistance to the States.

Training and Education and Workshops - $500,000. These funds are basic to the charge which FEMA has received to assist States and local governments in their preparation for dealing with nuclear incidents. The funds will be used to develop instructional programs, materials and techniques for the training of those who may be expected to be the first on the scene of such an incident - including medical personnel. As the REP program progresses, several workshops are planned in which appropriate Federal, State and local officials can consult on progress and problems.

Printing - $250,000. These funds are required to provide for an initial distribution of materials developed from the activities outlined above, including public information materials.

National Contingency Plan Development - $100,000. An integrated and comprehensive response to a nuclear emergency must be assured for the future. These funds are necessary to provide contractual support for development of this Plan.

Exercises Evaluation - $300,000. To be effective, plans which are developed must be exercised, and criteria established jointly by FEMA and NRC require an exercise before plan approval. The requested funding provides for the planning and evaluation of these exercises.

Evaluation Studies - $250,000. There is an immediate need for evacuation planning around twelve plants identified by NRC as critical because the population in the ten mile emergency planning zone exceeds 100,000. The requested amount would provide modest funding to permit the development of information and supporting plans for the rapid relocation of people subject to exposure in an accidental release.

Research and Development - $175,000. These funds are required to develop data and test systems to provide improved warning techniques for potentially affected populations, including establishing consistent bases for exercises evaluation, and to improve the instrumentation required both for radiological monitoring and for the meteorological analysis necessary to support incident management decisions.

Equipment - $100,000. These funds will provide for a trial production run of a new low-range dosimeter needed to meet the specific monitoring requirements generated by potential power plant releases. The run will demonstrate the feasibility of production techniques which will be required to produce instruments in the numbers required to meet foreseeable requirements.

MEMORANDUM OF UNDERSTANDING BETWEEN NRC AND FEMA TO ACCOMPLISH A PROMPT IMPROVEMENT IN RADIOLOGICAL EMERGENCY PLANNING AND PREPAREDNESS

I. BACKGROUND AND PURPOSE

This memorandum of understanding establishes a framework of cooperation between the Federal Emergency Management Agency (FEMA) and the Nuclear Regulatory Commission (NRC) in radiological emergency response planning matters, so that their mutual efforts will be directed toward more effective plans and related preparedness measures at and in the vicinity of nuclear reactors, fuel cycle facilities which are subject to 10 CFR Part 50 Appendix E, and certain other fuel cycle and materials licensees which have potential for significant accidental off-site radiological releases. The memorandum is responsive to the President's decision of December 7, 1979, that FEMA will take the lead in off-site planning and response, his request that NRC assist FEMA in carrying out this role and the NRC's continuing statutory responsibility for the radiological health and safety of the public.

Separate memoranda will be negotiated covering NRC/FEMA cooperation and responsibilities in response to an actual emergency and Public Information activities. In addition, an agreement has already been reached between the NRC and FEMA on September 11, 1979, that chairmanship of the Federal Interagency Central Coordinating Committee should be transferred from NRC to FEMA. This agreement was transmitted to other Federal agencies by a joint letter from the Chairman of NRC and the Director of FEMA. The NRC and FEMA also agreed in principle on September 11, 1979, to the idea of joint participation in the review, assessment and concurrence with regard to State and local emergency response plans. That agreement will be implemented by FEMA coordinating all Federal planning and by FEMA's taking the lead for developing a program for assessing State and local emergency response plans in all elements of off-site radiological emergency planning, and for making findings and determinations as to the adequacy and capability of implementing State and local plans, and to make those findings and determinations available to NRC. The NRC shall review those FEMA findings and determinations for the purpose of making determinations on the overall state of emergency preparedness for issuance of licenses or shutdown of operating reactors. The NRC proposal to require concurrence in State and local emergency response plans is described in the proposed emergency planning rule (44 FR 75167, December 19, 1979). This arrangement will make the FEMA staff responsible for evaluating the adequacy of State and local plans and for assuring that the plans are capable of implementation on a continuing basis, and will therefore substantially avoid duplicative efforts by NRC staff.

II. AUTHORITIES AND RESPONSIBILITIES

FEMA - Executive Order 12148 charges the Director, FEMA, with establishing policy for and coordinating all civil emergency planning and assistance functions for Executive agencies (Section 2-101). It also provides that "The Director shall represent the President in working with State and local governments and private sector to stimulate vigorous participation in civil emergency preparedness mitigation, response, and recovery programs." (Section 2-104).

On December 7, 1979, the President, in response to the recommendations of the Kemeny Commission on the accident at Three Mile Island, directed that FEMA assume lead responsibility for all off-site nuclear emergency planning and response.

Specifically, the FEMA responsibilities with respect to emergency preparedness as they relate to NRC are:

1. To take the lead in off-site emergency planning and review and assess State and local emergency plans for adequacy.
2. To complete by June 1980, the review of State and local emergency plans in those States affected by operating reactors.
3. To complete, as soon as possible, the review of State and local emergency plans in those States affected by plants scheduled for operation in the near future.
4. To make findings and determinations as to whether State and local emergency plans are adequate and capable of implementation (e.g., adequacy and maintenace of procedures, training, resources, staffing levels and qualifications and equipment adequacy).
5. To assume responsibility for emergency preparedness training of State and local officials.
6. To develop and issue an updated series of interagency assignments which would delineate respective agency capabilities and responsibilities and define procedures for coordination and direction for emergency planning and response.

NRC - The Atomic Energy Act of 1954, as amended, requires that the NRC grant licenses only if the health and safety of the public is adequately protected. While the Atomic Energy Act does not specifically require emergency plans and related preparedness measures, the NRC has required consideration of overall emergency preparedness as a part of the licensing process.

10 CFR 50.34 and Appendix E to 10 CFR Part 50 include requirements for the licensee emergency plans. In a Federal Register Notice dated December 24, 1975, entitled "Radiological Incident Emergency Response Planning: Fixed Facilities and Transportation" (40 FR 59494), the

Federal Preparedness Agency, a predecessor of FEMA, outlined responsibilities of various Federal agencies in providing assistance to State and local governments in their radiological emergency response planning. Both FEMA and NRC recognize that these responsibilities are undergoing reevaluation and that this memorandum of understanding will require reissuance of that Federal Register Notice.

Specifically, the NRC responsibilities for emergency preparedness are:

1. To assess licensee emergency plans for adequacy.
2. To verify that licensee emergency plans are adequately implemented (e.g., adequacy and maintenance of procedures, training, resources, staffing levels and qualifications and equipment adequacy).
3. To review the FEMA findings and determinations on the adequacy and capability of implementation of State and local plans.
4. To make decisions with regard to the overall state of emergency preparedness (i.e., integration of emergency preparedness on-site as determined by the NRC and off-site as determined by FEMA and reviewed by NRC) and issuance of operating licenses or shut down of operating reactors.

III. AREAS OF COOPERATION

A. NRC Licensing Reviews

FEMA will provide support for NRC reactor, fuel facility and material licensing reviews, as requested, with regard to the assessment of the adequacy of State and local response plans for accidental radiological releases. This will include timely submittal of a letter evaluation suitable for inclusion in NRC safety evaluation reports.

FEMA will provide NRC with an independent assessment of evacuation times around 12 reactor sites which have the highest population density within the 10 mile emergency planning zone or are mutually agreed upon by FEMA and NRC. FEMA and NRC agree to discuss future arrangements for similar assessments to be performed by FEMA at other sites with operating reactors and at plants currently under construction.

Substantially prior to the time that a FEMA evaluation is required with regard to fuel facility and material license review, NRC will supply FEMA with a listing of all fuel and material licensees, identify those with potential for significant accidental off-site radiological releases and for those NRC will submit to FEMA the emergency plans as they are completed.

FEMA routine support will include providing assessments of State and local plans related to reactor Construction Permit and Operating License reviews and continuing assessments of State and local plans during the facility lifetime. To support its findings and assessments, FEMA will make expert witnesses available before the Commission, the NRC Advisory Committee on Reactor Safeguards, NRC hearing boards and administrative law judges, any court actions, and during any related discovery proceedings. Nothing in this document shall be construed in any way to diminish NRC's responsibility for protecting the radiological health and safety of the public.

B. FEMA Review of State and Local Plans

NRC will assist in the development and review of State and local plans through its membership on the Regional Advisory Committees. FEMA will chair the Regional Advisory Committees.

C. Evaluation of Exercises

FEMA and NRC will cooperate in determining exercise requirements for joint licensee, State, local and Federal exercises and will jointly observe and evaluate such exercises. NRC and FEMA will also jointly agree upon the set of exercise scenarios from which the scenario for a particular exercise will be selected.

D. Emergency Preparedness Guidance

NRC has lead responsibility for the development of emergency preparedness guidance for licensees. FEMA has lead responsibility for the development of emergency preparedness guidance for State and local agencies.

NRC and FEMA recognize the need for an integrated assessment of the degree of emergency preparedness by NRC licensees and State and local governments. NRC and FEMA will each, therefore, provide opportunity for the other agency to review and comment on emergency preparedness guidance prior to adoption as formal agency guidance.

E. Training of State and Local Officials

FEMA will assume lead responsibility for emergency preparedness training of State and local officials. NRC will cooperate in assuring existing NRC sponsored training programs are impacted to the minimum extent during the period January to June, 1980. NRC will inform OMB in writing of its intention to pass responsibility to FEMA for its current training program for State and local officials during FY 1980 and will support FEMA in requesting OMB to transfer the training budget to FEMA in years after FY 1980.

F. Ongoing NRC Programs

Ongoing NRC programs that are related to State and local emergency planning and preparedness that are supported by FY 80 funds, will continue without interruption unless modifications are recommended to the NRC by the FEMA/NRC Steering Committee. (See IV.4 below).

G. Public Information Programs

FEMA will take the lead in developing public information programs. NRC will assist FEMA by reviewing for accuracy educational materials concerning radiation and its hazards and information regarding appropriate actions to be taken by the general public in the event of an accident involving radioactive materials. A separate memorandum of understanding will be negotiated for Public Information activities.

IV. NEAR-TERM COOPERATIVE MEASURES

In order to achieve a prompt improvement in the state of emergency preparedness at and around nuclear power facilities, and because of the need for an integrated assessment of the degree of preparedness, FEMA and NRC recognize the need for especially close working relationship over the next six months. To this end, FEMA and NRC agree to the following mode of operation through June of 1980.

1. NRC staff will proceed with the evaluation team review of emergency preparedness at each power reactor and will publish Safety Evaluations on each plant.

2. FEMA will provide members to participate with NRC staff on the evaluation teams. The FEMA team members will participate in the preparation of assessments of the off-site plans along with NRC. Team members will perform according to the procedures described in NRC Steering Committee Memorandum dated November 23, 1979, subject: Guidance on Team Reviews.

3. FEMA will provide an interim evaluation of the adequacy of State and local preparedness associated with each power reactor suitable for attachment to the NRC Safety Evaluation. FEMA will report to NRC on the schedules of State and local governments to upgrade their plans and will prepare a final evaluation when the upgraded plans are completed.

4. The NRC interoffice Steering Committee on Emergency Preparedness will be expanded to an NRC/FEMA Steering Committee consisting of equal number of members to represent each agency with one vote per agency. Where the Steering Committee cannot agree on the resolution of an issue, the issue will be referred to NRC and FEMA management. The NRC members will have lead responsibility for licensee preparedness and the FEMA members will have lead responsibility for State and local preparedness. The Steering

Committee will oversee the evaluation team review activities and develop upgraded acceptance criteria for licensee, State and local emergency preparedness. NRC and FEMA will then consider and adopt criteria, as appropriate, in their respective jurisdictions. (See Attachment 1).

5. To permit the orderly transfer from NRC to FEMA of the lead responsibility for evaluating State and local plans and preparedness, the NRC staff who had been performing this function will be assigned through June 1980 to work directly with FEMA. Those incidental activities, such as responding to correspondence that would normally be handled by the NRC's State Programs Emergency Preparedness Staff will continue to be handled by these personnel while assigned to FEMA. (See Attachment 2).

6. NRC will ensure continuation of NRC computer and automatic data processing support (including TERA record keeping system support) to the NRC staff personnel detailed to FEMA.

7. NRC Program Support funds specifically identified in the FY 80 budget (including supplemental), for the emergency preparedness function of NRC's Office of State Programs, and NRC FY 80 travel funds in the amount of $25,000 will be maintained as is, and continue to be managed by the NRC staff detailed to FEMA, to ensure that ongoing programs affecting State and local government emergency preparedness are not interrupted.

V. WORKING ARRANGEMENTS

A. The normal point of contact for implementation of the points in this agreement will be the NRC/FEMA Steering Committee.

B. The Steering Committee will establish the day-to-day procedures for carrying out the arrangements of this memorandum.

VI. TERM OF AGREEMENT

A. This agreement shall be effective as of January 14, 1980 and shall continue in effect through September, 1980, unless terminated by either party upon 120 days' notice in writing.

B. Amendments or modifications to this Agreement may be made upon written agreement by both parties to the Agreement.

Approved for the U. S. Nuclear
Regulatory Commission

By:
Lee V. Gossick
Executive Director
for Operations

Approved for the U. S. Federal
Emergency Management Agency

By:
Frank Camm
Associate Director
for Plans and Preparedness

Attachments:
1. FEMA/NRC Steering Committee
2. Duties of NRC Personnel Detailed to FEMA through June 1980

ATTACHMENT 1

FEMA/NRC STEERING COMMITTEE

Purpose

Coordinate efforts to promptly upgrade emergency preparedness for nuclear power reactors as described in NRC/SECY-79-450 and the President's statement of December 7, 1979. Coordinate consistent criteria for licensee, State and local emergency preparedness.

Membership

Co-Chairmen:

Brian Grimes	NRC
R. Ryan	FEMA

Members:

S. Wengrovitz	FEMA
J. Thomas	FEMA
H. Collins	FEMA (detailed from NRC)
J. Sniezek	IE/NRC
J. Miller	NRR/NRC
K. Perkins	OEDO/NRC

Duration

The Steering Committee will provide coordination for these activities until the initial evaluation team reviews are complete (about June 1980).

Coordination

When items involving responsibilities of other NRC or FEMA offices are discussed, the affected office will be contacted as appropriate.

ATTACHMENT 2

DUTIES OF NRC PERSONNEL DETAILED TO

FEMA THROUGH JUNE 1980

I. List of NRC Personnel Assigned to FEMA through June 1980

R. Ryan
H. Collins
S. Schwartz
R. Defayette
H. Gaut
R. Jaske
M. Sanders
S. Salomon
R. Clevenger
K. Green
R. Van Niel
S. Welch (administrative)
P. Weldon (clerical)

II. Description of Duties While Reassigned to FEMA

A. Participate in preparing an interim evaluation of the adequacy of State and local preparedness associated with each power reactor suitable for attachment to the NRC evaluation team Safety Evaluation. This will include determination on the adequacy of State and local schedules to upgrade State and local plans and in preparing final evaluations on completion of the upgraded emergency planning elements.

B. Participate with FEMA members and with other NRC staff on the evaluation teams so that the assessment will proceed on a coordinated basis and, along with FEMA personnel, to fulfill the roles formerly defined for the evaluation team members from the NRC Office of State Programs.

C. Review and assess State and local plans. This will assure consistency between evaluation team reviews and Regional Advisory Committee efforts.

D. Participate as assigned with other FEMA representatives on the NRC/FEMA Steering Committee. The Steering Committee will coordinate the evaluation team review activities and other NRC/FEMA activities and develop Upgraded acceptance criteria for licensee, State and local emergency preparedness to be published for comment.

E. Participate in developing a FEMA emergency preparedness training program for State and local officials and administering the current NRC programs in this area.

F. Perform other related duties as assigned by FEMA.

G. Continue to monitor ongoing FY 80 NRC funded programs related to State and local government emergency planning and preparedness.

III. Duty Station While Reassigned

FEMA offices in the GSA Building at 18th and F Streets, N.W.,
Washington, D. C. 20472

IV. Provisions Regarding Detail

An employee detailed to the U.S. Federal Emergency Management Agency (FEMA) will be returned to his/her permanent position when the detail is terminated unless the permanent position is impacted by a reorganization or restructure of functions. Should a reorganization or restructure occur, the individual will be returned to a position of the same grade and in an occupational series for which he/she is qualified. A letter stating this will be sent to each individual detailed.

An employee detailed to FEMA in excess of 30 calendar days will receive an NRC Form 181 which will document the detail. A short description of the duties to which he/she is assigned should be entered on, or appended to, the NRC Form 181 to assure proper evaluation of the employee's work performance when detailed to FEMA. Such documentation will be filed in the employee's Official Personnel Folder (OPF).

At the conclusion of an employee's detail, and provided that the length of the detail is more than four months, an appropriate FEMA or NRC management official will prepare a Personnel Performance Appraisal (NRC Form 625A). The appraiser will evaluate the employee's performance at FEMA and this evaluation will be considered by the employee's permanent supervisor when that supervisor prepares the annual performance appraisal.

June 18, 1980

FEDERAL EMERGENCY MANAGEMENT AGENCY

44 CFR Part 350

[Docket No. FEMA-PP-350]

Review and Approval of State and Local Radiological Emergency Plans and Preparedness

AGENCY: Federal Emergency Management Agency (FEMA)

ACTION: Proposed Rule

SUMMARY: This rule proposes to establish policy and procedures for review and approval by FEMA of State and local emergency plans and preparedness for coping with the offsite effects of radiological emergencies which may occur at nuclear power facilities. The rule does not cover other Nuclear Regulatory Commission (NRC) licensed facilities. The rule sets out criteria which will be used by FEMA in reviewing, assessing and evaluating these plans and preparedness; it specifies how and where a State may submit plans; it describes certain of the processes by which FEMA makes findings and determinations as to the adequacy of State and local plans and the capability of State and local government to effectively implement these plans and preparedness measures for specific sites. Such findings and determinations and, where appropriate, plan approvals are to be submitted to the Governors of the affected States and to the NRC for use in licensing proceedings of the NRC.

DATE: Comments are due [within 60 days from date of publication]. It is intended, after careful consideration has been given to the comments and appropriate adjustments made, to make the regulation, which is primarily procedural, effective immediately upon its adoption.

ADDRESS: Send comments to Rules Docket Clerk, Federal Emergency Management Agency, Room 801, 1725 I Street, NW, Washington, DC 20472

FOR INFORMATION CONTACT: John McConnell, Assistant Associate Director, Population Preparedness, telephone 202/566-0550.

SUPPLEMENTARY INFORMATION:

Presidential assignments:

On December 7, 1979, the President, in response to the recommendations of the President's Commission on the Accident at Three Mile Island (known as the Kemeny Commission) announced, in part, a series of decisions and took a number of actions in the area of emergency planning and preparedness, particularly with respect to offsite emergency planning and preparedness. The President directed FEMA to

(1) take the lead in offsite emergency planning and response;

(2) complete by June 1980, the review of State emergency plans in those States with operating nuclear power facilities;

(3) complete as soon as possible the review of State emergency plans in those States with nuclear power facilities scheduled for operation in the near future;

(4) develop and issue an updated series of interagency assignments which delineate respective agency capabilities and responsibilities and clearly define procedures for coordination and direction for both emergency planning and response.

FEMA is presently reviewing existing State and local plans in accordance with the Presidential directive.

FEMA is also in the process of developing interagency assignments which will replace a description of assignments set out in a Notice published in the FEDERAL REGISTER on December 24, 1975 (40 FR 59494). It is FEMA's intent to publish these new assignments in separate rulemaking.

The rule in this part largely involves the process FEMA will use in taking the lead in offsite emergency planning and response. It provides for the review of plans by a formal process for evaluation and approval by FEMA of State plans (which include local plans as annexes to the State plan) and evaluation and assessment of the adequacy of capabilities of State and local governments to implement the plans.

Basis for FEMA Assignment:

The Director, FEMA, pursuant to Reorganization Plan No. 3 of 1978 and Executive Order 12148 of July 20, 1979 establishes policies for, and coordinates civil emergency planning, management, mitigation and assistance functions of the Executive agencies of the United States. The Director FEMA, represents the President in working with State and local governments and the private sector to stimulate vigorous participation in civil emergency preparedness, mitigation, response and recovery programs.

The term "civil emergency" is defined in 2-203 of Executive Order 12148 to include any accidental, natural, man-caused, or wartime emergency or threat thereof, which causes or may cause substantial injury or harm to the population or substantial damage to or loss of property. This definition clearly encompasses an accident at a nuclear power facility.

Under section 201 of the Disaster Relief Act of 1974, (42 U.S.C. 5131) the Director is to establish a program of disaster preparedness which includes, among other matters, preparation of disaster preparedness plans for warning, emergency operations, training and exercises, and coordination of Federal, State and local programs. Further, the Director is to provide technical assistance to States in developing comprehensive plans and practical programs for preparation against disasters.

The agencies which were combined to form the nucleus of FEMA, as well as NRC have been for some years involved in planning for radiological emergencies at nuclear power facilities. These activities were voluntary, as neither Federal law nor regulations required States or local governments to have peacetime nuclear emergency plans, nor required States with plans to test those plans.

The Atomic Energy Commission (AEC) later NRC, implemented an nonstatutory program of planning and assistance to the States which included: the formation of a Federal Interagency Central Coordinating Committee (FICCC); the preparation and issuance of Guide and Checklist for Development and Evaluation of State and Local Government Radiological Emergency Response Plans in Support of Fixed Nuclear Facilities, reissued as NRC NUREG-75/111; and the formation of task forces on training and exercises and emergency instrumentation.

The Office of Emergency Planning (OEP), later the Federal Preparedness Agency (FPA) and now FEMA issued descriptions of agency assignments. In January 1973, the OEP issued a statement that the AEC, as lead agency, would provide planning assistance to State and local governments for the preparation of radiological emergency response plans.

On December 24, 1975, the FPA reissued a revised and updated FEDERAL REGISTER Notice (40 FR 59494). Lead agency responsibility for "reviewing and concurring in State radiological emergency response plans," was assigned to the NRC and the planning assistance was expanded to include transportation of radioactive materials. NRC also issued guidance - Radiological Emergency Response Planning, Handbook for Federal Assistance to State and Local Governments NUREG 0093, June 1, 1976 - applicable to other Federal agencies. The number of involved agencies who all agreed to the assignments increased to eight. These included the Environmental Protection Agency (EPA), the Department of Health, Education and Welfare, now the Department of Health and Human Services, (DHHS) and the Defense Civil Preparedness Agency (DCPA) whose functions have now been transferred to FEMA. Other agencies included the Department of Transportation (DOT), the Federal Disaster Assistance Administration (FDAA-HUD) (now a part of FEMA), and the Energy Research and Development Administration (ERDA) (now Department of Energy (DOE)).

This interagency process with NRC as lead agency continued for the next few years. The NRC established a program of voluntary concurrence and concurred in several State plans. The accident at the Three Mile Island nuclear power facility which occurred on March 28, 1979, caused a major rethinking of the whole area of emergency plans and preparedness by NRC and by other authorities. The accident led to the Kemeny Commission Report and the Presidential actions.

To implement the President's assignment, NRC and FEMA on January 14, 1980, signed a Memorandum of Understanding (MOU) describing each agency's responsibilities in preparing for emergencies at nuclear facilities and activities (45 FR 3847).

The agreement applies to emergency preparedness for all commercial nuclear power plants, certain nuclear fuel cycle facilities, and nuclear materials licensees whose operations have a potential for significant accidental offsite releases of radiation. However, the parties intended that the initial program emphasis be placed on emergency preparedness at commercial nuclear power plants. This rule deals only with nuclear power facilities.

Among other matters under the MOU, FEMA's responsibilities are:

(1) To take the lead in off-site emergency planning and review and assess State and local emergency plans for adequacy.

(2) To complete by June 1980, the review of State and local emergency plans in those States with operating reactors.

(3) To complete, as soon as possible, the review of State and local emergency plans in those States with plants scheduled for operation in the near future.

(4) To make findings and determinations as to whether State and local emergency plans are adequate and capable of implementation (e.g. adequacy and maintenance of procedures, training, resources, staffing levels and qualifications and equipment adequacy).

(5) To assume responsibility for emergency preparedness training of State and local officials.

(6) To develop and issue an updated series of interagency assignments which would delineate respective agency capabilities and responsibilities and define procedures for coordination and direction for emergency planning and response.

The NRC responsibilities for emergency preparedness are:

(1) To assess licensee emergency plans for adequacy.

(2) To verify that licensee emergency plans are adequately implemented (e.g., adequacy and maintenance of procedures, training, resources, staffing levels and qualifications and equipment adequacy).

(3) To review the FEMA findings and determinations on the adequacy and capability of implementation of State and local plans.

(4) To make decisions with regard to the overall state of emergency preparedness (i.e., integration of emergency preparedness on-site as determined by the NRC and off-site as determined by FEMA and reviewed by NRC) and issuance of operating licenses or shut down of operating reactors.

Thus, the lead for review of the adequacy of offsite emergency plans and their capability of implementation has been placed in FEMA and there is no longer an NRC voluntary concurrence program for State emergency plans. This activity is now ended, and to that extent the notice of December 24, 1975, is superseded. The previous NRC "concurrences" do not satisfy all the requirement for FEMA approval of State and local plans under this regulation.

FEMA review and findings and determinations will be based upon guidance jointly issued by FEMA and NRC entitled Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants NUREG-0654/FEMA-REP-1. This guidance and acceptance criteria provides a basis for NRC licensees and State and local governments to develop radiological emergency plans and improve emergency preparedness associated with nuclear power facilities. The document combines the guidance to State and local governments with the guidance to the licensees of NRC and supersedes previous guidance and criteria published by FEMA and NRC. It is intended for use by reviewers in reviewing and assessing the adequacy of State, local and nuclear power facility operator emergency plans and preparedness. FEMA-REP-1/NUREG 0654 contains a series of planning objectives (which are part of this rule) and a listing of specific criteria for preparation and evaluating of the planning and preparedness activities of State and local governments as well as of the licensees of NRC. The document is presently being revised by NRC and FEMA as a result of public comment submitted pursuant to a Notice published on Feburary 13, 1980 at 45 FR 9768. It is the intent that the planning objectives in this rule will be in exactly the same words as the planning objectives in a NRC rule on Emergency Preparedness (See. 44 FR/75167).

That NRC rulemaking procedure contains additional material relevant to this rule in the materials cited therein. This rule has been prepared in coordination with the NRC emergency planning and preparedness rule.

In this connection it should be noted that the wording of Section 350.9(e) may be somewhat different from that in NRC regulations because their rules are written for licensees. But it is the intent that the meanings of the respective rules are the same.

NRC retains overall responsibility for making decisions under their enabling legislation in determining whether licenses should be issued or operations suspended. NRC expects to evaluate deficiencies, if any, identified by FEMA to ascertain whether those deficiencies are significant and if they are significant, determine whether compensatory measures have been or will be taken by the licensee.

FEMA's approval of State and local plans and preparedness should be considered independently of any rules of the NRC with respect to its licensing proceedings. The rule proposed in this part is in no way dependent upon any authority available to the NRC. However, recognition must be given to the fact that the NRC now will base its findings on a review of FEMA findings and determinations as to whether State or local plans are adequate and capable of being implemented. The regulation described in this part is designed with that FEMA review function in mind. Proposed section 350.12(f) provides an appeal procedure to the Director from the decision of the Associate Director. Procedures for processing appeals are not established as yet but will be incorporated in the final rule or will be the subject of a separate rule dealing with appeals in Federal Emergency Management Agency programs generally.

Hearing procedures will be made a part of the final rule.

This regulation describes a procedure by which FEMA evaluates and assesses State and local emergency plans and preparedness to deal with a radiological emergency, and "approves" such plans. Further, FEMA may use the data obtained in its approval process to support its findings in Nuclear Regulatory Commission licensing proceedings and any related court actions; and during any related discovery proceedings.

Insofar as FEMA is concerned, there is no requirement in law that a State or local government submit its plan to FEMA, and FEMA's failure to approve such plan is not accompanied by any sanction or refusal to accord a benefit. Insofar as the procedure may have economic, environmental or legal consequences or impact, these result from NRC action on its rule and from the role which FEMA plays because of the MOU in the NRC licensing process. NRC has in connection with its rule adopted a "Finding of No Significant Impact" and has made an environmental assessment which covers actions covered by this regulation. In the interest of reducing paperwork and pursuant to CEQ regulations 40 CFR 1506.3, FEMA herein adopts as part of its own decision making process that part of the NRC assessment applicable to this rule. For the final rule FEMA plans to develop its own assessment.

Further the NRC statement addresses the subject of cost, and it is clear from this that neither the NRC rule, nor this FEMA rule is a significant regulation which requires a regulatory analysis under Executive Order 12044.

Pending adoption of the final rule, FEMA intends to use generally the process described herein in "approval" of any plan

Accordingly, it is proposed to amend Subchapter E of Chapter I, Title 44 Code of Federal Regulations by adding a new Part 350 as follows:

PART 350: Review and Approval of State Radiological Emergency Plans and Preparedness.

Sec.

350.1 Purpose
350.2 Definitions
350.3 Background
350.4 Exclusions
350.5 Criteria for review and approval of State and local Radiological Emergency Plans and Preparedness
350.6 Assistance in development of State and local Plans
350.7 Application by State for review and approval
350.8 Initial FEMA Action on State plan
350.9 Exercises
350.10 Public meeting in advance of FEMA approval
350.11 Action by FEMA Regional Director
350.12 FEMA Headquarters review and approval
350.13 Withdrawal of approval
350.14 Amendment to State plans
350.15 Hearings [RESERVED]

Authority: 42 U.S.C. 5131, 5201, 50 U.S.C. App. 2253(g) Reorganization Plan No. 3 of 1978 (3 CFR 1973 Comp. p. 329), Executive Order 12127 (44 F.R. 19367), Executive Order 12148 (44 F.R. 43239)

§ 350.1 Purpose.

The purpose of the regulation in this part is to establish policy and procedures for review and approval by the Federal Emergency Management Agency (FEMA) of State and local emergency plans and preparedness for the offsite effects of a radiological emergency which may occur at a nuclear power facility. Review and approval of these plans and preparedness involves preparation of findings and determinations with respect to the adequacy of the plans and the capabilities of State and local governments effectively to implement the plans.

§ 350.2 Definitions.

As used in this part the following terms have the following meanings:

Director means, the Director, Federal Emergency Management Agency;

Regional Director means a Regional Director of FEMA

Associate Director means Associate Director, Plans and Preparedness (FEMA);

NRC means the Nuclear Regulatory Commission;

EPZ means Emergency Planning Zone.

§ 350.3 Background.

(a) On December 7, 1979, the President directed the Director to take the lead in State and local emergency planning and preparedness activities with respect to nuclear power facilities. This included a review of the existing emergency plans both in States with operating reactors, and those with plants scheduled for operation in the near future.

(b) This assignment was given to FEMA in view of its responsibilities under Executive Order 12148 to establish Federal policies for, and coordinate civil emergency planning, management and assistance functions, and to represent the President in working with State and local governments and the private sector to stimulate vigorous participation in civil emergency preparedness programs. Under Section 201 of the Disaster Relief Act of 1974 (42 U.S.C. 5131), and other statutory functions, the Director, FEMA, is charged with the responsibility to develop and implement plans and programs of disaster preparedness.

(c) To carry out these responsibilities, FEMA is engaging in a cooperative effort with State and local governments and other Federal agencies in the development of State and local plans and preparedness to cope with the offsite effects resulting from radiological emergencies at nuclear power facilities.

(d) FEMA has entered into a memorandum of understanding (MOU) with the NRC to which it will furnish assessments, findings and determinations as to whether State and local emergency plans and preparedness are adequate and continue to be capable of implementation (e.g., adequacy and maintenance of procedures, training, resources, staffing levels and qualification and equipment adequacy). These findings and determinations can be used by NRC under its own rules in connection with its licensing and regulatory requirements and FEMA will support its findings in the NRC licensing process and related court proceedings.

§ 350.4 Exclusions.

The regulation in this part does not apply to, nor will FEMA apply any criteria with respect to, any evaluation, assessment or determination regarding the NRC licensee's emergency plans or preparedness, nor shall FEMA make any similar determination with respect to integration of offsite and NRC licensee emergency preparedness except as these assessments and determinations affect the emergency preparedness of State and local governments. The regulation in this part applies only to State and local planning and preparedness with respect to emergencies at nuclear power facilities and does not apply to other facilities which may be licensed by NRC.

§ 350.5 Criteria for review and approval of State and local radiological emergency plans and preparedness.

(a) The following joint NRC-FEMA planning objectives, which apply insofar as FEMA is concerned to State and local governments, are to be used in evaluating, assessing, reviewing and approving State and local radiological emergency plans and preparedness and in making any findings and determinations with respect to the adequacy of the plans and the capabilities of State and local governments to implement the plans. It is the intent that the planning objectives set out herein are identical to those of NRC.

(1) Primary responsibilities for emergency response by the nuclear facility licensee, and by State and local organizations within the Emergency Planning Zones have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

(2) On-shift facility operator responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, and timely augmentation of response capabilities is available, and the interfaces among various onsite response activities and offsite support and response activities are specified. (This objective applies to NRC licensees but is included here for completeness).

(3) Arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the licensee's near-site Emergency Operations Facility have been made, and other organizations capable of augmenting the planned response have been identified.

(4) A standard emergency classification and action level scheme whose bases include facility system and effluent parameters is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

(5) Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all response organizations; the content of initial and followup messages to response organizations and the public have been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.

(6) Provisions exist for prompt communications among principal response organizations, to emergency personnel and to the public.

(7) Information is made available to the public on a period basis on how they would be notified and what their initial actions should be in an emergency (e.g. listening to a local broadcast station and remaining indoors) the principal points of contact with the news media for dissemination of information during an emergency (including physical location or locations) are established in advance; and procedures for coordinated dissemination of information to the public are established.

(8) Adequate emergency facilities and equipment to support the emergency response are provided.

(9) Adequate methods, systems and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.

(10) A range of protective actions has been developed for the plume exposure EPZ pathway for emergency workers and the public, guidelines for the choice of protectrive actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.

(11) Means for controlling radiological exposures, in an emergency, are established for workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

(12) Arrangements are made for medical services for contaminated injured individuals.

(13) General plans for recovery and reentry are developed.

(14) Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills; deficiencies identified as a result of exercises or drills are corrected.

(15) Radiological emergency response training is provided to those who may be called upon to assist in an emergency.

(16) Responsibilities for plan development and review and distribution of emergency plans are established and planners are properly trained.

(b) In order for State or local plans and preparedness to be approved, such plans and preparedness must be determined to adequately protect the public health and safety by providing reasonable assurance that appropriate protective measures can and will be taken offsite in the event of a radiological emergency. Plans and preparedness will be evaluated using the objectives set forth in subsection (a) and as detailed in FEMA

§ 350.6 Assistance in Development of State and Local Plans.

(a) An integrated approach to the development of offsite radiological emergency plans by States, localities and the licensees of NRC with the assistance of the Federal Government is the approach most likely to provide the best protection to the public. Hence Federal agencies, including FEMA regional staff, will be made available upon request to assist State and localities in the development of plans.

(b) There now exists in each of the ten Standard Federal Regions, a Regional Assistance Committee (RAC)(formerly the Regional Advisory Committee) chaired by a FEMA regional official and having members from Nuclear Regulatory Commission (NRC), Department of Health and Human Services (DHHS), Department of Energy (DOE), Department of Transportation (DOT), Environmental Protection Agency (EPA), and Department of Agriculture (DOA). The basic functions of the RAC are to assist State and local government officials in preparing and revising radiological emergency plans, and improving the preparedness capabilities of State and local governments for dealing with accidents and emergencies at nuclear power facilities.

(c) In accomplishing the foregoing, the RACs will use the criteria in FEMA-REP-1/NUREG 654, and will render such technical assistance as may be required. The RACs will also observe and evaluate exercises and identify in a timely fashion deficiencies in the planning and preparedness effort including deficiencies in resources, training of staff, equipment, staffing levels, and deficiencies in the qualifications of personnel.

§ 350.7 Application by State for Review and Approval.

(a) A State which seeks review and approval by FEMA of the State's radiological emergency plan, with annexes (which for purposes of this

best copy available

part includes the plans of all local governments for all jurisdictions wholly or partially within the plume exposure pathway EPZ for the applicable nuclear power facility and for the host jurisdictions in the event of an evacuation), shall submit an application for such review and approval to the FEMA Regional Director of the Region in which the State is located. The application, in the form of a letter from the Governor or from such other State official as the Governor may designate, shall contain one copy of the completed State plan, including the plan for the ingestion pathway. The application shall specify the site or sites for which plan approval is sought.

(b) Generally, the plume exposure pathway EPZ for nuclear power facilities shall consist of an area about 10 miles (16 Km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 Km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power facility shall be determined in relation to the emergency response needs and capabilities as they are affected by such local conditions as demography, topography, land characteristics, access routes, and local jurisdictional boundaries. The size of the EPZs may be determined by NRC in consultation with FEMA on a case-by-case basis for gas cooled reactors and for reactors with an authorized power level less than 250 Mw thermal. The plans for the ingestion pathway shall focus on such actions as are appropriate to protect the food ingestion pathway.

(c) FEMA and the States will make suitable arrangements in the case of overlapping or adjacent jurisdictions to permit an orderly assessment and approval of interstate or interregional plans.'

(d) Only a State may request review of a State or local radiological emergency plan. The State will designate the unit(s) of the local government whose plans will be submitted as annexes to the State plan.

(e) A State may submit separately its plans for the EPZ's and the local government plans specific to the plume exposure pathway EPZ for individual nuclear power facilities. The purpose of separate submissions is to allow approval of a State plan, and of the plans necessary for specific nuclear power facilities in a multi-facility State, while not approving or acting on the plans necessary for other nuclear power facilities within the State. If separate submissions are made, appropriate adjustments in the State plan may be necessary.

(f) The application shall contain a statement that the State plan, together with its annexes, is, in the opinion of the State, adequate to protect public health and safety of its citizens living within the emergency planning zones for the nuclear power facilities included in the submission by providing reasonable assurance that appropriate protective measures can and will be taken by State and local governments within the emergency planning zone in the event of a radiological emergency for the site in question.

§ 350.8 Initial FEMA action on State Plan.

(a) The Regional Director shall acknowledge in writing the receipt of such an appliation to the State within ten days of its receipt.

(b) FEMA shall cause to be published in the FEDERAL REGISTER within 30 days after receipt of the application, notice that an application from a State has been received and that copies are available at the Regional Office for review and copying in accordance with Section 5.26, Sub Part C of Part 5 and Appendix A to Part 5 of this chapter.

(c) The Regional Director shall furnish copies of the plan to members of the RAC for their analysis and evaluation.

(d) The Regional Director shall make a detailed review of the plan together with its annexes, and will assess the capability of the State or local governments to effectively implement the plan. Such review should, in addition to application of the criteria specified in Section 350.5, consider (1) the integration of planning of the NRC licensee with the localities around the nuclear facility and the State, and the linkage between plans, and (2) elements dealing with notification, communications, public information, equipment, accident assessment, drills and exercises and emergency planning zones recommended by FEMA, NRC and EPA for planning around nuclear power facilities.

(e) In connection with the review, the Regional Director may make suggestions to States concerning perceived gaps or deficiencies in the plans, and the State may amend the plan at any time prior to forwarding to the Associate Director.

(f) Two conditions for FEMA approval of State plans (including local government annexes) call for activity during regional review and prior to the forwarding of the plan to the Associate Director. These are the requirement for a complete exercise, see § 350.9 of this part, and for public participation, see § 350.10 of this part.

§ 350.9 Exercises.

(a) FEMA approval of State plans (and appropriate local government annexes) shall in each case be site specific.

(b) Before a Regional Director can forward a State plan and annexes to the Associate Director for approval, the State together with all necessary local governments must conduct a complete exercise of that State plan, involving participation of appropriate local government entities, the State and the appropriate licensee of NRC. To the extent achievable, this exercise shall include participation by appropriate Federal agencies. This exercise shall be observed and evaluated by FEMA and to the extent possible by representatives of other agencies with membership on the RACs, and by NRC with respect to licensee response. Following the debriefing of all involved parties, if the exercise discloses any deficiencies in the State and local plans, or the ability of the State and local governments to implement the plans, the FEMA representatives shall make them known promptly in writing to appropriate State officials and, to the extent necessary, the State shall amend the plan to incorporate recommended changes or improvements.

(c) The Regional Director of FEMA shall be the FEMA official responsible for certifying to the Associate Director that a complete exercise of the State plan has been conducted, and that any deficiencies noted in the exercise have been corrected and such corrections incorporated in the plan.

(d) On an annual basis, all nuclear power facilities will be required by NRC to exercise their plans and the exercises should involve annual exercising of the appropriate local government plans in support of these facilities. The State may choose to limit its participation in exercises at facilities other than the facility (site) chosen for the annual exercise(s) of the State plan.

(e) For continued FEMA approval, each State and appropriate local governments shall conduct an exercise jointly with a nuclear power facility at least annually. However, States with more than one facility (site) shall schedule exercises such that each individual facility (site) is exercised in conjunction with the State and appropriate local government plans not less than once every three years for sites with the plume exposure pathway EPZ partially or wholly within the State and not less than once every five years for sites with the ingestion exposure pathway EPZ partially or wholly within the State. The State shall choose, on a rotational basis, the site(s) at which the required annual exercise(s) is to be conducted, and priority shall be given to new facilities seeking an operating license from NRC, and which have not had an exercise involving the State plan at that facility site.

(f) After FEMA approval of a State and local plan has been granted, failure to exercise the State and local plans on the frequency described in this section shall be grounds for withdrawing FEMA approval (see Section 350.13).

§ 350.10 Public Meeting in Advance of FEMA approval.

During the FEMA Regional Office review of a State plan, and prior to the submission by the Regional Director of the plan to the Associate Director, the FEMA Regional Director shall assure the conduct of at least one public meeting in the vicinity of the nuclear power facility. The purpose of such a meeting, which may be conducted by the State or by the Regional Director, shall be to acquaint the members of the public in the vicinity of each facility with the content of the State and related local plans, to answer any questions about the FEMA review and to receive suggestions from the public concerning improvements or changes that may be necessary; and to describe to the public the way in which the plan is expected to function in the event of a real emergency. The Regional Director should assure that representatives from appropriate State government agencies, local and county agencies and the affected utility appear at such meetings to make presentations and to answer questions from the public. These meetings shall be noticed in the local newspaper having the largest circulation in the area on at least two occasions one of which is at least two weeks before the meeting takes place and the other is within a few days of the meeting date. Local radio and television stations should be notified of the scheduled meeting at least one week in advance. Representatives from NRC and other appropriate Federal agencies should also be invited to participate in these meetings. If, in the judgment of the FEMA Regional Director, the public meeting or meetings reveal gaps or deficiencies in the State plan, the Regional Director shall inform the State of the fact together with recommendations for improvement.

No FEMA approval of State and local plans shall be made until a meeting described in this paragraph shall have been held at or near the nuclear power facility site for which the State is seeking approval.

§ 350.11 Action by FEMA Regional Director.

(a) Upon completion of his/her review including conduct of the exercise required by Section 350.9 and after the public meeting required by Section 350.10, the Regional Director shall prepare an evaluation of the State plan, including plans for local governments. Such evaluation shall be specific with respect to the plans applicable to each nuclear facility so that findings and determinations can be made by the Associate Director on a site specific basis.

(b) The Regional Director shall evaluate the adequacy of State and local plans and preparedness on the basis of the criteria set forth in Section 350.5, and shall report that evaluation with respect to each of the planning objectives mentioned therein as such apply to State and local plans and preparedness. The Regional Directors evaluation report may also address any of the other criteria contained in FEMA REP 1 (NUREG 0654) "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," or in other guidance issued by FEMA or by NRC as such apply to State and local offsite radiological emergency plans and preparedness. This evaluation will not include a recommendation on approval.

(c) The Regional Director shall forward the State plan together with his or her evaluation and other relevant record material to the Associate Director for Plans and Preparednss.

§ 350.12 FEMA Headquarters review and approval.

(a) Upon receipt from a Regional Director of a State plan, the Associate Director shall cause copies of the plan together with the Regional Director's evaluation to be distributed to the members of the Federal Interagency Central Coordinating Committee (FICCC) and to other offices of FEMA with appropriate guidance relative to their assistance in the FEMA review process.

(b) The Associate Director shall conduct such review of the State plan as he or she shall deem necessary.

(c) Within 30 days after submission of the State plan by the Regional Director, if the Associate Director, finds and determines that the State plans and preparedness:

(1) are adequate to protect the health and safety of the public living in the vicinity of the nuclear power facility by providing reasonable assurance that appropriate protective measures can and will be taken offsite in the event of a radiological emergency; and

(2) are capable of being implemented (see Section 350.3(d)), the Associate Director shall approve, in writing the State plan. The Associate Director shall communicate this FEMA approval to the Governor of the State in question and the NRC and immediately shall cause to be published in the FEDERAL REGISTER a notice to this effect.

(d) If the Associate Director is not satisfied with the adequacy of the plan or preparedness with respect to a particular site , he or she shall communicate that decision to the Governor(s) of the State(s), to any involved licensee, to the NRC or other interested person, together with a statement in writing explaining the reasons for the decision and requesting appropriate plan or preparedness revisions. Such statement shall be transmitted to the Governor(s) through the appropriate Regional Director(s).

(e) The approval shall be of the State plan together with the local plans (which are annexes to the State plan) for each nuclear power facility (including out of State facilities) for which approval has been requested. FEMA may withhold approval of plans applicable to a specific nuclear power facility in a multi-facility State, but nevertheless approve the State plan and associated local plans applicable to other facilities in a State. (Approval may be withheld for a specific site until plans for all jurisictions within the emergency planning zones of that site have been reviewed and found adequate.)

(f) Within 30 days after the date of notification of approval for a particular nuclear power facility or within 30 days of any statement of inadequacy or withdrawal of approval of a State plan, any interested person may appeal the decision of the Associate Director to the Director; however, such appeal must be made solely upon the ground that the Associate Director's decision, based on the available record was unsupported by substantial evidence. See Section 350.15 for hearing procedures.

§ 350.13 Withdrawal of approval.

If, at any time after granting approval of a State plan, the Associate Director determines, on his or her own initiative, motion or on the basis of information another person supplied, that the State or local plan is no longer adequate to protect public health and safety by providing reasonable assurance that appropriate protection measures can be taken, or is no longer capable of being implemented, he or she shall immediately advise the Governor of the affected State and NRC of that initial determination in writing. FEMA shall spell out in detail the reasons for its initial determination and shall describe the deficiencies in the plan or the preparedness of the State. If, after four months from the date of such an initial determination, the State in question has not (1) either corrected the deficiencies noted, or (2) submitted an acceptable plan for correcting those deficiencies, the Associate Director shall withdraw approval, and shall immediately inform NRC and the Governor of the affected State, of the determination to withdraw approval and shall cause to be published in the FEDERAL REGISTER and the newspaper having the largest daily circulation in the affected State, notice of its withdrawal of approval. Such action by the Associate Director is subject to the appeal procedure specified in Section 350.12(f).

In the event that the State in question shall submit a plan for correcting the deficiencies, the Associate Director shall negotiate a schedule and timetable under which the State shall cure the deficiencies. If, on the agreed upon date, the deficiencies have been cured, the Associate Director shall withdraw the initial determination and the approval previously granted shall remain valid and shall inform the Governor(s), and the NRC. If, however, on the agreed upon date, the deficiencies are not cured, FEMA shall withdraw its approval and shall communicate its decision to the Governor of the State whose plan is in question, to the NRC, and to the appropriate Federal agencies and notify the public as above.

§ 350.14 Amendments to State plans.

(a) The State may amend a plan submitted to FEMA for review and approval under Section 350.11 at any time during the review process or may amend a plan at any time after FEMA approval shall have been granted under section 350.12. A State must amend its plan in order to extend the coverage of the plan to any new nuclear power facility which becomes operational after a FEMA approval or in case of any other significant change. The State plan shall remain in effect as approved while any significant change is under review.

(b) Unimportant changes (such as a change in a telephone number) should be forwarded to the Regional Director.

(c) A significant change will be processed in the same manner as if it were an initial plan submission. However, the Regional Director may determine that certain procedures, such as holding a public meeting would be unnecessary in connection with an amendment.

(d) A significant change is one which involves the evaluation and assessment of a planning objective or which involves a matter which if presented with the plan would need to have been considered by the Associate Director in making a decision that State or local plans and preparedness are: (1) adequate to protect the health and safety of the public living in the vicinity of the nuclear power facility by providing reasonable assurance that appropriate protective measures can be taken offsite in the event of a radiological emergency; and (2) capable of being implemented.

Date:

//Signed— June 18, 1980

John W. Macy, Jr.
Director
Federal Emergency Management
Agency

Billing Code 6718-01

COUNCIL OF THE CITY OF PHILADELPHIA
OFFICE OF THE CHIEF CLERK
ROOM 402, CITY HALL
PHILADELPHIA

(Resolution No. 169)

RESOLUTION

To cease construction of the Limerick Nuclear Reactors.

WHEREAS, On May 27, 1980, Harold Denton, director of the Office of Reactor Regulations of the Nuclear Regulatory Commission, testified at Congressional hearings in Bucks County Community College that the Limerick plant is too close to Philadelphia and the NRC may "modify or withhold" the operating license for Limerick, and

WHEREAS, The Limerick nuclear reactors under construction since 1971 are only 21 miles from Philadelphia and within a 30-mile radius of 4 million people, and

WHEREAS, Evacuation plans for Philadelphia in case of a major accident at Limerick are not feasible, and

WHEREAS, The Pennsylvania Office of the Consumer Advocate has opposed the continuation of construction of the Limerick nuclear reactors on the grounds of excess generating capacity compared with the need of Philadelphia Electric Company and the high costs, estimated at 5.6 billion dollars rather than 3.2 billion dollars estimated by Philadelphia Electric Co., and

WHEREAS, Philadelphia Electric Co. originally projected completion of Limerick I in May 1976 and Limerick II in May 1977, and now projects completion of Limerick I in 1985 and Limerick II in 1987, while costs continue to escalate, and

WHEREAS, This high cost of construction would be borne by the ratepayers of Philadelphia Electric Co. and the government, in tax investment credits of 10% and accelerated depreciation allowances, and

WHEREAS, Permanent nuclear waste disposal sites have not yet been developed or demonstrated feasible by the utilities or the government, and

WHEREAS, The United States Environmental Protection Agency has termed inadequate the projected supplies of cooling water for Limerick of 40 million gallons per day of Delaware River water, and

WHEREAS, In case of a nuclear accident at Limerick, liability insurance provided by the utilities and federal government is limited to only $560 million, less than 5% of damages estimated possible by government reports, and

WHEREAS, Psychological stress will add to the health problems of residents in Philadelphia and the surrounding areas as demonstrated in the Three Mile Island accident, now

Be It Resolved by the Council of the City of Philadelphia, That all construction cease at the Limerick nuclear reactors plants to protect the health and safety of Philadelphia residents and the ratepayers of Philadelphia Electric Co.

Resolved, Further, that certified copies of this resolution be sent to the President of the United States, the Nuclear Regulatory Commission, the Governor of Pennsylvania, all Philadelphia legislators in Harrisburg, the two U.S. Senators and Philadelphia Congressmen.

CERTIFICATION: This is a true and correct copy of the original Resolution adopted by the Council of the City of Philadelphia on the twenty-ninth day of May, 1980.

President of City Council

ATTEST:

Charles H Sawyer Jr

Chief Clerk of the Council

Introduced by
DAVID COHEN

Sponsored by
DAVID COHEN
AUGUSTA A. CLARK
LUCIEN E. BLACKWELL
JOSEPH E. COLEMAN
JOHN F. STREET
JOHN C. ANDERSON
BEATRICE K. CHERNOCK